DECEMBER 15, 1912
VOL. IV. NO. 4

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ONE YEAR, $2.00

THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

PEERLESS TRUCKS

Save 50% on Interurban Freights

A HUNDRED miles a day with a quarter of a carload of miscellaneous freight is the average performance of this 5-ton long chassis Peerless.

Two round trips between Boston and Brockton total 88 miles of direct travel. Collection and distribution of the loads in each city raises the average 12 to 20 miles more.

In addition to establishing the freight time at three hours between shipment and receipt of goods over a 22 mile route this Peerless has cut the expense in two.

TRUCK DEPARTMENT

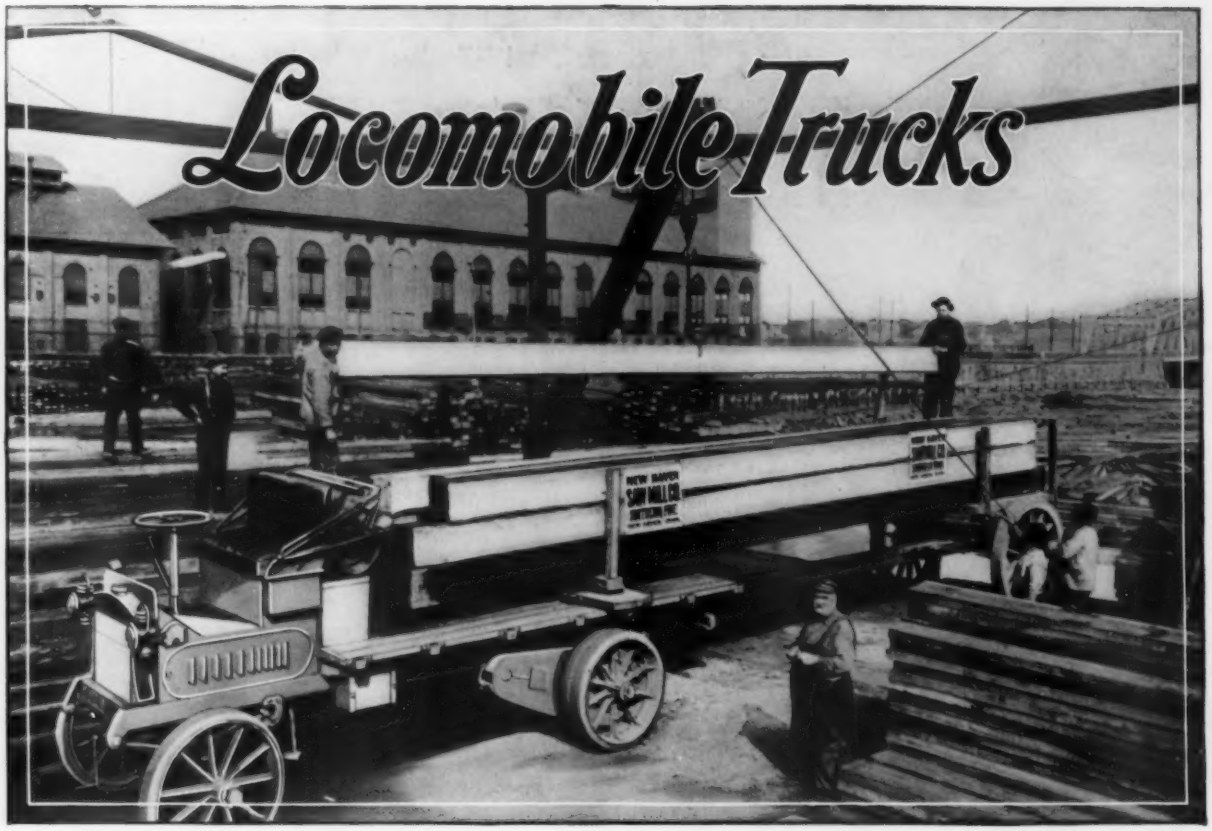
THE PEERLESS MOTOR CAR CO., CLEVELAND

Builders also of Peerless Passenger Cars

PUBLISHED THE 15TH OF EACH MONTH

CHILTON COMPANY

MARKET & 49TH STS. PHILADELPHIA



Every Part is Designed for Heavy Truck Duty

A famous American engineer designed the Locomobile Five-Ton Truck, and commercial cars designed by him fourteen years ago are still in use and giving satisfaction.

The strength of Locomobile design can be appreciated best by a comparison. For example: Compare the Locomobile Truck Motor with a well-known touring car motor of the same bore and stroke and noted for its strength of design.

The Locomobile Truck Motor has 5 bearings; the other motor 3 bearings.

The Locomobile Truck Motor has a crankshaft 2.25 inches in diameter. The touring car motor crankshaft is 1.75 inches in diameter.

The Locomobile Truck Motor has a total crankshaft bearing surface of 41.3 square inches; the other 21.5 square inches.

The Locomobile Truck Motor has larger valves, larger connecting rods, and larger connecting rod bearings. All other parts of the Locomobile Truck show the same careful and ample design for heavy truck duty and no touring car parts enter into its construction.

Other important features of the Locomobile Five-Ton Truck are:

Every part designed for heavy truck duty.
Highest standards of workmanship.
Best materials used.
Motor—45 H. P. at 900 R. P. M.
Five bearing crank shaft.
Four speed transmission.
Large transmission gears.

These features combined only in the Locomobile Five-Ton truck.

Interchangeable Demountable Tires.
Driving chains each stand 44,000 lbs. pull.
Differential lock.
Steel Wheels.
Dry Disc Clutch.
Sprags.
All parts easily accessible.

Ignition and oiling system not subject to driver's control.

THE LOCOMOBILE COMPANY OF AMERICA, Bridgeport, Connecticut

Service and Sales Branches

New York	Chicago	Philadelphia	San Francisco	Boston	Pittsburgh	Washington
Atlanta	Los Angeles	St. Louis	Minneapolis	Baltimore	Oakland	Bridgeport

This advertisement is No. 6 in a series descriptive of Locomobile Design and Construction

The Publishers' Personal Page

We Wish You All a Merry Christmas
And a Prosperous New Year

A Word to the Advertiser

The average business man demands what he pays for; yet, when it comes to advertising, he is continually paying for something he does not get. Is this good business? The advertising rates of all publications are based primarily upon circulation, and the circulation is too often based upon hot air. Yet the advertiser readily parts with his money on the statement, without proof, of the solicitor.

Compulsory Statement of Circulation

The Chilton Company has made a stand for compulsory publication of circulation statements, these statements to be verified by the Post Office Department, from the record of the publishers. We believe that the circulation liar should be penalized, and that failure to tell the truth should result in the forfeiture of the second-class mail privilege.

What Objection

can any publisher who is honest make to having his real circulation known? We cannot understand upon what ground an honest publisher can object to the plan which has been outlined.

The proposition was first presented to the Philadelphia Trade Press Association, which body adopted a resolution approving of the movement, and asked for the views of other associations in the Federation. The matter was then placed before the Federation of Trade Press Associations of America. This body, which should be representative of the trade press of the country, discussed the proposed plan for making circulation statements compulsory, and apparently approved. The matter, however, was turned over to a committee on recommendations, which promptly dropped it, and so far as we have been able to learn no report whatever was made to the Federation.

How long are the advertisers going to allow themselves to be fleeced by dishonest publishers?

The Chilton Company does not intend to let this matter drop until compulsory circulation statements are assured.

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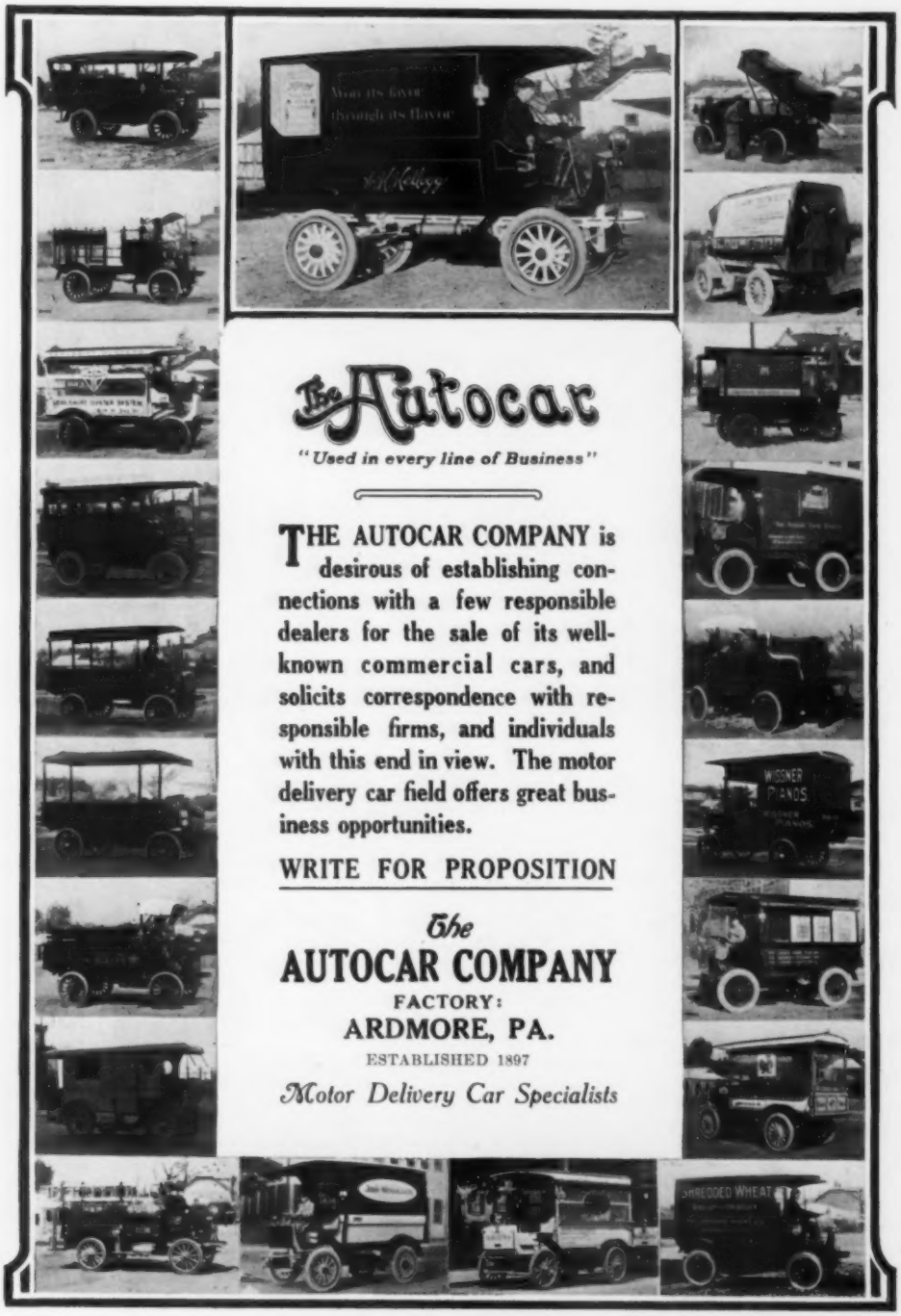


The Autocar

"Used in every line of Business"

THE AUTOCAR COMPANY is desirous of establishing connections with a few responsible dealers for the sale of its well-known commercial cars, and solicits correspondence with responsible firms, and individuals with this end in view. The motor delivery car field offers great business opportunities.

WRITE FOR PROPOSITION

The
AUTOCAR COMPANY
FACTORY:
ARDMORE, PA.
ESTABLISHED 1897
Motor Delivery Car Specialists

The Commercial Car Journal

VOLUME IV PHILADELPHIA, DECEMBER 15, 1912 NUMBER 4

NEW YORK STATE HIGHWAY COMMISSION TO LIMIT WEIGHT OF COMMERCIAL CARS

The New York State Highway Commission has framed up a law which will be submitted to the State Legislature to prohibit from the use of any State or county highway any vehicle the weight of which shall exceed in combined weight of load and vehicle, as related to the width of tire, as follows: The maximum weight on a single axle shall be, for 1½-in. tires, 1200 lbs.; for 2-in. tires, 1600 lbs.; for 2½-in. tires, 2000 lbs.; for 3-in. tires, 2400 lbs.; for 4-in. tires, 4800 lbs.; for 5-in. tires, 5600 lbs.; for 8-in. tires, 6400 lbs.; for 9-in. tires, 7200 lbs., and for 10-in. tires, 8000 lbs.

Thus the heaviest load that can be carried on the highways will be 8 tons. It is needless to say that this legislation will be fought by all users of trucks and by the entire trade and is scarcely likely to become a law.

MORGAN TRUCK COMPANY TO BE REORGANIZED

A meeting of the Morgan Motor Truck Company is being held just as we go to press, for the purpose of effecting a reorganization. Its affairs are being liquidated in the bankruptcy court. A decree of court has authorized settlement with the creditors on the basis of 15 cents on the dollar. A plan will be presented for putting more capital in the business, and resuming the manufacture of motor trucks on a larger scale. Should this plan not be adopted, it is probable that the business will be wound up.

MACHINE TOOLS WILL BE EXHIBITED AT THE COMMERCIAL CAR SHOW

The management of the National Automobile Show, Madison Square Garden, New York, have made arrangements with the National Machine Tool Builders' Association to set aside a section of the building for the exhibit of machine tools used in the manufacture of automobiles during the commercial car week of the show, from January 20th to 25th. This idea is also being adapted by the management of the Boston Automobile Show.

RAYMOND DENIES GOODRICH-UNITED STATES RUBBER COMBINE

Several weeks ago a rumor was persistently circulated that the B. F. Goodrich Rubber Company made a deal whereby the United States Rubber Company would be consolidated with it, the combined company to have a capital of $250,000,000. These companies have a capital of about $90,000,000 each. H. E. Raymond, of the Goodrich Company, is reported as stating that there is no truth in the report,—that nothing of the kind is being thought of.

PHILADELPHIA SHOW WILL PROBABLY BE HELD IN THE NEW AUTOMOBILE CLUB BUILDING

The Philadelphia Automobile Trade Association has made arrangements with the Automobile Club of Philadelphia for the use of its immense new building, 23rd and Market Streets, for the holding of an annual show each year. Three floors of the building will be used, which will give 90,000 sq. ft. of floor space.

For several years the show has been held in two armories, widely separated, the combined area of which was only 65,000 sq. ft. The new Automobile Club building is almost finished, and the Trade Association agrees to pay $7500 rental for three weeks from January 15th to February 5th, and to pay all the expense for operating the building during these three weeks.

The plan provides that in future years three additional floors will be built on the building to be used for show purposes one month in the year, and to be used by the club members for clubrooms, etc., the balance of the year, giving Philadelphia a permanent automobile show building. Of course, commercial cars will be shown here as well as pleasure cars.

HURON RIVER COMPANY REORGANIZED WITH MORE CAPITAL

Huron River Manufacturing Company, Ann Arbor, Mich., which has been manufacturing commercial cars for the past year, has been merged with a recently organized company, known as the Star Motor Car Company. The new company was organized under the laws of Maine, with $500,000 capital, and the personnel of the new company is practically the same as that of the old.

Its officers are Gottlieb Luick, president; Dr. Underhill, vice-president; Wesley Seabolt, secretary; J. D. Butler, additional director. It is stated that the new company will enlarge the factory and build commercial cars on a much larger scale.

WINTON MOTOR CAR COMPANY, Cleveland, O., was said to be turning out a 6-cylinder, 1½-ton commercial car. This statement has been denied by the company, for it is not manufacturing a commercial vehicle of any kind.

PEERLESS MOTOR CAR COMPANY has called a meeting of stockholders at Cleveland on December 20th, to act on a proposal to increase the capital stock from $3,000,000 to $10,000,000, equally divided between preferred and common.

FEDERAL MOTOR TRUCK COMPANY, Detroit, Mich., has increased its capital stock to $100,000 by declaring a stock dividend, and has also declared a cash dividend of 10 per cent.

Many New Commercial Cars at the New York Show

TWENTY-ONE different makes of commercial cars never before exhibited in New York will be displayed during the second week of the New York Automobile Show, from January 20 to 25, in the New Grand Central Palace. Most of the older and better known makes will be displayed in Madison Square Garden, where the public has become accustomed to look for them. This year the electric vehicles will all be grouped together in the Palace, so that a few of the early truck makers, including several real pioneers in the field, will be found in company with the newest makers in the fold.

Sixty-eight commercial car companies already have contracted for space at the Show. There will be additions no doubt that will bring the list to between seventy and seventy-five this winter.

Of the score of makes not previously exhibited, one-half are entirely new to the market, never having been exhibited before in any show. Most of the others are western products, for which their makers are seeking Eastern recognition. Some of them have been in the market for a number of years and have made good in exacting service over poor roads in the central states.

The new makes include both gasoline and electric vehicles. They embrace all sizes, from delivery wagons of 1000 lbs. capacity to 6-ton trucks. An even greater range of size will be found among the older makers, ranging from about 800 lbs. to 10-tons load capacity.

While a majority of the models on view will be fitted with standard bodies suitable for the commoner lines of business, there will be a great diversity, from florists' wagons and motor ambulances to motor fire apparatus, automatic dump trucks and so forth.

The following concerns will exhibit commercial cars at New York:

At Madison Square Garden

American Locomotive Co.
Autocar Co.
Buick Motor Co.
Federal Motor Truck Co.
Garford Co.
General Motors Truck Co.
Gramm Motor Truck Co.
Hewitt Motor Co.
Hupp Motor Car Co.
Kelly - Springfield Motor Truck Co.
Kissel Motor Car Co.
Knox Automobile Co.
Locomobile Co. of America.
Mack Bros. Motor Car Co.
Packard Motor Car Co.
Peerless Motor Car Co.
Pierce-Arrow Motor Car Co.
Pope Manufacturing Co.
Reo Motor Car Co.
Saurer Motor Co.
Selden Motor Vehicle Co.
Speedwell Motor Car Co.
Velie Motor Vehicle Co.
Walter Motor Truck Co.
White Co.

At Grand Central Palace

Atlantic Vehicle Co.
Atterbury Motor Car Co.
Baker Electric Vehicle Co.
Bessemer Motor Truck Co.
Blair Mfg. Co.
Bowling Green Motor Car Co.
Brown Commercial Car Co.
Buffalo Electric Vehicle Co.
Chase Motor Truck Co.
Dart Mfg. Co.
Durant-Dort Carriage Co.
General Motors Truck Co.
General Vehicle Co.
Gramm-Bernstein Co.
Grand Rapids Motor Truck Co.
Hydraulic Truck Sales Co.
Krebs Commercial Car Co.
H. J. Koehler S. G. Co.
Lansden Co.
Lauth-Juergens Motor Car Co.
Lippard-Stewart Motor Car Co.
Mack Car Co.
Mais Motor Truck Co.
Mercury Manufacturing Co.
M. & P. Electric Vehicle Co.
Randolph Motor Truck Co.
Rowe Motor Mfg. Co.
Sanford Motor Truck Co.
Schacht Motor Car Co.
Service Motor Car Co.
A. O. Smith Co.
Standard Motor Truck Co.
Stegeman Motor Car Co.
Sternberg Motor Truck Co.
International Harvester Co. of America.
Stewart Motor Corporation.
Studebaker Corporation.
Sullivan Motor Car Co.
Universal Motor Truck Co.
Ward Motor Vehicle Co.
Waverly Co.
Webb Co.

PERSONAL ITEMS

F. B. PATRICK, formerly connected with the Chicago American, is now advertising manager of the Victor Rubber Company, Springfield, O.

F. B. HUTCHINSON, JR., of the Horseless Age, has accepted the position of advertising manager for the Kelly-Springfield Motor Truck Company, Springfield, O.

CLIFFORD B. MEYERS, formerly with the Diamond Rubber Company, has been appointed general manager of the Swinehart Tire & Rubber Company, Akron, O.

GEO. H. DUCK, formerly New York branch manager of the "Alco" business, has been promoted to the post of general superintendent of service for the "Alco" business throughout the country.

L. A. BARTLETT, formerly sales manager of the Poss Motor Company, Detroit, Mich., has joined the sales force of the Universal Truck Company, and has been assigned to the Chicago territory.

CHAS. M. PACKHAM, formerly connected with the American Seeding Machine Company, Springfield, O., has resigned to become manager of the Kansas City branch of the Kelly-Springfield Motor Truck Company.

REPUBLIC RUBBER COMPANY, Youngstown, Ohio, has elected L. T. Peterson first vice-president, succeeding L. J. Lomansey, deceased, and John H. Kelley has been elected second vice-president to succeed Mr. Peterson. A. H Harris has been elected a director of the Company to fill the remaining vacancy on the board. Mr. Kelley remains general sales manager of the company.

A Story Without Words

WALTER E. FLANDERS BECOMES PRESIDENT OF REORGANIZED UNITED STATES MOTOR COMPANY

The United States Motor Company, whose reorganization plans have been outlined in a previous issue, has made an arrangement for Walter E. Flanders, of the Flanders Motor Company, and previously of the Studebaker Corporation, to become president of the reorganized company, at the time when the complete reorganization takes place, which will be some time in January next. Under this arrangement the Flanders Motor Company, of Detroit, becomes part of the United States Motor Company, the present owners of the Flanders Company receiving $1,000,000 in cash and $2,750,000 in stock for the business of the Flanders Motor Company. It is also understood that Mr. Flanders will give up his connection with the Flanders Manufacturing Company, of Pontiac, Mich., and will devote his entire energies to the business of the United States Motor Company. He has been visiting the various plants of the United States Motor Company, situated at Tarrytown, Hartford, Dayton, Newcastle, Indiana and Detroit, Mich., with the idea of deciding what models among those which the United States Motor Company has made in the past should be continued.

Mr. Flanders has issued a statement that all the old agents and dealers, who have been selling the United States Motor Company's product, will continue to handle the line undisturbed, and that other good, competent men in the old organization, whether in the field or in the factory, will be needed.

However, it is expected that Mr. Flanders' well-known lieutenants, Paul Smith, who has been with Mr. Flanders for a number of years as sales manager, and E. LeRoy Pelletier, who has been his advertising manager, will occupy the same positions with the United States Motor Company.

The Flanders "Six" has already been sold in great numbers, and there is no doubt but that this car will be a large feature in the product of the United States Motor Company, but, it is stated, that other new models will be added to the line.

E. A. Nelson has resigned as chief engineer of the Hupp Motor Car Company, but will continue to act as consulting engineer for the company. F. E. Watts, his former assistant, has been appointed chief engineer.

Charles E. Reynolds, for years connected with the bicycle industry, has been made general representative of the Chase Motor Truck Company for the Chicago territory, with headquarters at 701 Marquette Building.

Col. V. F. Whitesides has severed his connection with the Whitesides Commercial Car Company, of Newcastle, Ind., and expects to start a new company at Indianapolis for the manufacture of a commercial car of his own design, to be known as the Ironsides.

Emerson Brooks, formerly with the Remington Standard Motor Company, of New York City, has purchased an interest in the firm of Burr & Company, well known body builders of New York City. Mr. Brooks was formerly vice-president of J. M. Quimby & Company.

Henry M. Duncan has succeeded William F. Smith as supervisor of the Eastern District of the United States Motor Company, acting as manager of the United Motor Philadelphia Company in looking after the branches located in Syracuse, Pittsburg, Washington and Atlanta.

C. Sorrell, formerly connected with the National Motor Vehicle Company, has been appointed head of service department of the George C. Brinkman Motor Car Company, St. Louis, Mo. Charles R. Porter has joined the sales force of the company, and will handle Smith-Milwaukee trucks.

N. H. Miniter, who for several years has been Sales Manager of the Stromberg Motor Devices Company, has resigned his position with that concern and is now associated with the Findeisen & Kropf Manufacturing Company, of Chicago, as Factory Sales Manager. He will in future represent the Rayfield Carburetor throughout the country.

Henry Hess, principal owner in the Hess-Bright Company, of Philadelphia, has sold his interest to the D. W. F. Ball Bearing Company, of Germany, whom the Hess-Bright Company have been representing in the United States for many years. Fred. E. Bright, formerly vice-president of the Hess-Bright Company, has assumed the presidency and complete ownership control of the company. A. T. Bruegel has been elected secretary and C. L. McCalla, treasurer.

FINANCIAL AFFAIRS

Poss Motor Company, Detroit, Mich., has been drawn into bankruptcy by its creditors, and Edw. H. Rogers has been appointed receiver.

Louisville Auto & Wagon Company, 221 South Ninth Street, Louisville, Ky., has assigned, for the benefit of its creditors, the Louisville Trust Company. The officers of the company are Albert White, president, and R. W. Miller, secretary.

Westfield Motor Truck Company, Westfield, Mass., has filed a petition in bankruptcy. The liabilities are placed at $20,616.67, and the assets at about $4000. A number of suits have been brought against the company, and this forced the bankruptcy proceedings.

Charles M. Manly, inventor of the Manly Hydraulic Drive, has secured a writ of attachment for $6491.90 against the Remington Standard Motor Car Company, which is a licensee under the Manly patent. His claim is made up of labor and material, one transmission and royalties.

Stevenson Motor Truck Company, S. Milwaukee, Wis., which announced about a year ago that it had been sold to the J. I. Case Threshing Machine Company, has brought suit against the Pierce Motor Company, Racine, Wis., a subsidiary company of the J. I. Case organization, for $100,000 for alleged breach of contract, the Stevenson Company claiming that the Pierce Motor Company and the J. I. Case Company failed to live up to a contract which had been made to take over all of their patent stock and manufactured cars.

The United States Motor Company, and its subsidiary companies will be sold at public auction January 8th, at 11 A. M. at Room 47, Federal Building, New York City. Properties can be disposed of in single lot or sold in six parcels. According to the rule made by Judge Hough, the bidder will have to put up a cash deposit of $250,000. It is stated by the attorneys for the Reorganization Committee that this sale, at which they expect to be the buyers, will not be interfered with by the petition to throw the company into bankruptcy, which has been filed by several of the smaller creditors, and it is not expected that there will be any hitch in the reorganization plans.

NEW FACTORIES, TRUCKS AND CHANGES

HYDRAULIC TRUCKS TO BE MADE ON THE PACIFIC COAST

The Hydraulic Auto Truck Corporation, 13 S. Grand Avenue, Los Angeles, Cal., has been organized to build and market the La France hydraulic trucks on the Pacific Coast.

The company is composed of W. E. Barnes, president; H. W. Whitford, vice-president; T. L. McFadden, secretary; T. W. Burger, treasurer, and D. L. Whitford, general manager. As their license permits them to market these trucks anywhere in America, the company expects to extend its operation as quickly as it is in position to do so.

Ideal Commercial Car Company, Akron, O., has changed its name to Akron Motor Car & Truck Company.

Moreland Truck Factory, Los Angeles, Cal., is enlarging its plant to double its present capacity.

Stewart Iron Works, Cincinnati, O., has completed its three-story brick factory building for the manufacture of auto trucks.

Union Tool Company, Torrence Cal., is erecting a new building for the manufacture of commercial cars to cost $100,000.

Jas. Sweeney, of Buffalo, N. Y., has purchased property on Payne Ave., North Tonawanda, N. Y., and will establish a large auto truck manufacturing plant.

Empire Automobile Company has secured a ten-year lease of the White Building, 47 Warren St., Glens Falls, N. Y., where motor trucks will be manufactured.

Leo Gillig, well-known in the automobile trade in San Francisco, Cal., has designed a 1500 lb. commercial car, which he will place on the market for the 1913 trade.

Miller & Van Winkle Company, Brooklyn, N. Y., well-known manufacturers of automobile springs, are erecting a new plant to take care of its greatly increased business.

Wyckoff, Church & Partridge Company's salesroom and garage at 56th & Broadway, has been sold to the Swetland Operating Company, organized for the purpose of buying this property from H. M. Swetland, who was one of the largest creditors of the company.

Palmer Moore Company, Syracuse, N. Y., bought the large plant on North Geddes Street, for a number of years owned and occupied by the Syracuse Stove Works. Palmer-Moore Company will establish there an important industry for the manufacture of trucks.

Buffalo Electric Vehicle Company, Buffalo, N. Y., which recently purchased the Babcock Electric Carriage Company, and the Clark Motor Company, have announced that they will bring out a line of electric commercial cars from 1000 lbs. to 2 tons capacity.

Piggins Motor Truck Company, 1113 W. Sixth St., Racine, Wis., has been offered all kinds of inducements to leave Racine and locate elsewhere. The company must double the capacity at once on account of the demand for trucks. Unless Racine capital takes hold of this concern, there is in all probability danger of losing it from the large list of manufacturing institutions.

Binghamton Motor Car Company, 195-197 Water Street, Binghamton, N. Y., has started to manufacture light motor trucks. W. G. Fatz, proprietor of the company, believes that a large local business for a home made truck can be established. About thirty-five men will be employed.

The United States Rubber Company is building extensive factory additions to its several plants, having arranged for the expenditure of about $3,000,000 for the erection of sixteen new factory buildings, the most important of which will be additions to the Morgan & Wright plant, at Detroit, Mich.

The Ravenna Motor Truck Company has been organized at Ravenna, O., to manufacture a light delivery commercial car designed by Frank Traves. Work has been started on the erection of a factory building 50 x 150 ft.

The officers of the new company are: Frank Traves, president; S. O. Daugherty, vice-president; W. J. Moinat, secretary and treasurer. Additional directors, Steven Burgeon and W. K. Daugherty.

Oliver Motor Truck Company, Detroit, Mich., has taken over the business of the Oliver Motor Car Company, buying the assets of the other company from the receiver. The officers of the new concern are G. A. Meyer, president and general manager; F. J. Meyer, treasurer; R. F. Beach, sales manager, and D. Brewster, superintendent. The factory is located at 460 Lawton Avenue. The new company will manufacture a 1500 lb. light delivery car, and a 3000 lb. truck.

Willys-Overland Company, Toledo, O., has increased its capital to $25,000,000, and though the official personnel of the company is not changed, the Kinsey Manufacturing Company, the Garford Automobile Company, of Elyria; the Gramm Motor Truck Company, of Lima, and the Morrows Manufacturing Company, of Elmira, N. Y., will be taken under the direction of the owning company. One-half of the added capital stock, all common, has been purchased by Salmon & Company, of New York.

The Chicago Automobile Trade Association has decided that in the rules governing its contest to be held during 1913, of commercial cars, the new standard body weight allowances adopted by the National Association of Automobile Manufacturers must be adhered to, and it is expected that this stipulation will stimulate interest in the contests.

D. K. T. Company, 932 National Avenue, Milwaukee, Wis., is producing a motor-driven rotary ice plow, which is a tremendous improvement over anything heretofore produced for cutting ice.

Sternberg Motor Truck Company, Milwaukee, Wis., has closed a contract with the Warren Sales Company, 1413 Michigan Ave., for the future use of the G. & T. carburetor.

Firestone Tire and Rubber Company, of Akron, O., has moved its Philadelphia branch to 304 North Broad Street, Philadelphia.

New Incorporations and Reorganizations

CANNON MOTOR COMPANY, Des Moines, Ia., has been organized to build a light commercial car and a roadster.

MAIS MOTOR TRUCK COMPANY, Indianapolis, Ind., has been reorganized with capital stock of $1,000,000. F. H. Wheeler is president.

GUMPRICE MOTOR TRUCK COMPANY has been formed in Chicago, Ill., with a capital of $100,000, by H. E. Rice, Jr., W. C. Haight and Paul Corkell.

MORTON MOTOR PLOW COMPANY has been formed at Galion, Ohio, with a capital stock of $250,000, for the purpose of manufacturing motor plows designed by A. R. Morton.

AMERICAN MOTOR FIRE APPARATUS COMPANY has been organized in Pittsburgh, Pa., with $1,000,000 capital. The incorporators are T. F. Bethell, P. F. Chambers and Thos. L. Pfarr.

LIGHT COMMERCIAL CAR COMPANY has been organized at Wilmington, Del., with a capital of $100,000 to manufacture light delivery cars. The incorporators are Herbert E. Latter, Wm. J. Maloney and Norman P. Coffin.

SHARF GEARLESS MOTOR CAR COMPANY, Richwood, Ohio, has been incorporated with $5000 capital stock for the purpose of building a demonstrating car, of the Sharf Gearless type, after which a larger company will be formed for its manufacture.

AMERICAN COMMER TRUCK, INC., with a capital of $10,000, has been incorporated by the interest represented by Chester Griswold, H. C. Dickerson and George A. Ellis, who purchased the Wyckoff, Church & Partridge property from the receiver. It is supposed that the new company will continue the production of Commer trucks in this country.

NORTHWAY MOTOR COMPANY was recently incorporated in West Virginia, with a capital of $600,000, at the head of which is Ralph E. Northway, formerly of the Detroit company bearing his name, who has purchased the assets of the Ohio Motor Car Company for $60,000. In addition to continuing the manufacture of the Ohio car the new company will build motors for the trade. Associated with Mr. Northway in the new company are Wm. Peabody, Wesley D. Fruste, Edw. E. Deckabach and F. W. Enslow.

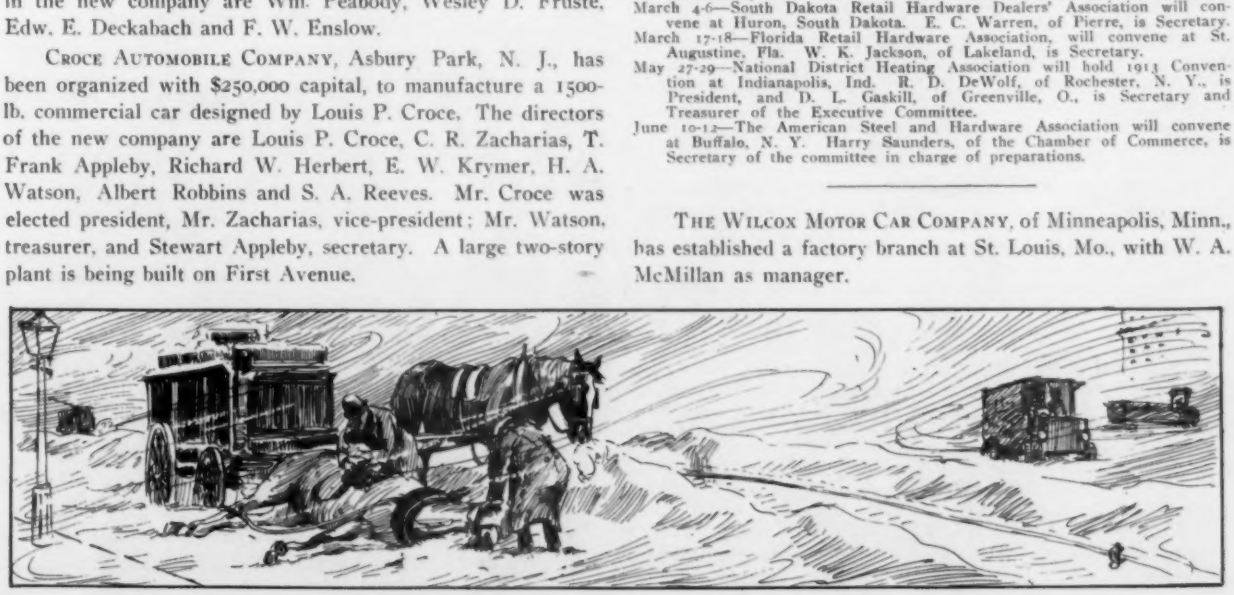
CROCE AUTOMOBILE COMPANY, Asbury Park, N. J., has been organized with $250,000 capital, to manufacture a 1500-lb. commercial car designed by Louis P. Croce. The directors of the new company are Louis P. Croce, C. R. Zacharias, T. Frank Appleby, Richard W. Herbert, E. W. Krymer, H. A. Watson, Albert Robbins and S. A. Reeves. Mr. Croce was elected president, Mr. Zacharias, vice-president; Mr. Watson, treasurer, and Stewart Appleby, secretary. A large two-story plant is being built on First Avenue.

CONVENTIONS OF INTEREST TO THE TRADE

The list of conventions given below is to be published each month so that commercial car manufacturers can communicate with the proper authorities with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines, also possibly to show and demonstrate their cars.

January 7-8—Annual Convention of the Georgia Hotel Men's Association, Chicago, Ill., at the Hotel Dublin.
January 8-10—Annual Meeting of the National League of Commission Merchants, Cincinnati, Ohio.
January 9-10—Idaho Retail Hardware & Implement Dealers' Association will convene at Boise, Idaho. H. M. Haudm is Secretary.
January 9-11—Forty-ninth Annual Convention of the National Wool Growers' Association, Cheyenne, Wyo.
January 14-15—Annual Convention of the Western Association of Retail Cigar Dealers, at Tacoma, Wash. W. L. Alfred, 1152 Pacific Avenue, is Secretary.
January 14-16—The Tri-State Grain Growers' Association's next Annual Convention, Fargo, N. D.
January 21-23—Connecticut Dairymen's Association will meet in Meriden, at the Auditorium, with hotel headquarters at the Winthrop. J. G. Schwink, Jr., is Secretary.
January 21-23—Arkansas Horticultural Society will hold Annual Convention at Fort Smith, Ark.
January 21-23—Ohio Association of Retail Lumber Dealers' Association will convene in Cleveland, O.
January 21 to 24—Wisconsin Retail Hardware Association Convention at Milwaukee, Wis. Geo. W. Kornely, 806 Third Street, is Secretary.
January 22-24—Southwestern Lumbermen's Association will hold Convention in Kansas City, Mo.
January 23-24—Annual Convention of the National Lumber Exporters' Association, at Chattanooga, Tenn.
January 29-30—The Pennsylvania Lumbermen's Association is to convene in the Hotel Walton, Philadelphia, Pa.
February 11-13—Michigan Retail Hardware Association is to convene at Detroit, Mich. Headquarters at Hotel Cadillac.
February 11-13—Annual Convention of the Texas Hardware & Implement Association, Dallas, Tex.
February 12-14—Second Annual Convention of the Buttermakers' Association at Cedar Rapids, Iowa. J. J. Brunning, of Strawberry Point, is Secretary.
February 18-20—Kentucky Retail Hardware and Stove Dealers' Association Convention, Galt House, Louisville, Ky. J. M. Stone, Sturgis, Ky., is Secretary.
February 18-20—Colorado Retail Hardware and Implement Association will convene at Pueblo, Colo., with headquarters at Congress and Vail Hotels. J. F. Jones, of Denver, and F. C. Moys, of Boulder, are President and Secretary respectively.
February 18-20—Convention of the North Dakota Retail Furniture Dealers' and Undertakers' Association, at Jamestown, N. D. M. H. Borman, of Abercrombie is President, and A. S. Millough, of Wimbledon, is Secretary.
February 18-21—Minnesota Retail Hardware Association will convene at St. Paul, Minn., exhibition to be held at St. Paul Auditorium. Thos. G. McCracken, Metropolitan Life Bldg., Minneapolis, is Secretary.
February 18-21—New York State Hardware Association will hold eleventh annual convention in the new Broadway Convention Hall, Buffalo, N. Y. La Fayette Hotel will be convention headquarters. John B. Foley, of Syracuse, N. Y., is Secretary.
February 20-28—Ohio State Retail Hardware Merchants' Association Convention, Sunday's Tabernacle, Columbus, O. J. Y. Bassell, Secretary, Chamber of Commerce, is in charge of arrangements.
February 25-27—New England Hardware Dealers' Association will hold convention and exhibition at Springfield, Mass.
February 25-28—Fifteenth Annual Convention of the Iowa Retail Hardware Association, to be held in the Des Moines Coliseum, Des Moines, Iowa.
March 4-6—South Dakota Retail Hardware Dealers' Association will convene at Huron, South Dakota. E. C. Warren, of Pierre, is Secretary.
March 17-18—Florida Retail Hardware Association, will convene at St. Augustine, Fla. W. K. Jackson, of Lakeland, is Secretary.
May 27-29—National District Heating Association will hold 1913 Convention at Indianapolis, Ind. R. D. DeWolf, of Rochester, N. Y., is President, and D. L. Gaskill, of Greenville, O., is Secretary and Treasurer of the Executive Committee.
June 10-12—The American Steel and Hardware Association will convene at Buffalo, N. Y. Harry Saunders, of the Chamber of Commerce, is Secretary of the committee in charge of preparations.

THE WILCOX MOTOR CAR COMPANY, of Minneapolis, Minn., has established a factory branch at St. Louis, Mo., with W. A. McMillan as manager.



COMMERCIAL CAR AGENCIES WANTED BY:

Austin's Garage, Iola, Wis., wants gasoline commercial cars of 1 and 2 tons capacity, to sell at $1000 to $2000.

Sutton-Miller Company, Inc., Indiana, Pa., want gasoline cars of 1½ and 2 tons capacity; selling at $1800 to $2500.

R. T. Smith, Cedar St., Three Forks, Mont., wants gasoline and electric cars of 2 to 5 tons; selling price to be $1500 to $2500.

H. F. Auto Company, Roswell, N. Mex., want gasoline and electric cars of 2 tons and less.

W. W. Butts, 37 Mechanic Street, Oxford, N. Y., wants gasoline cars of 1500 lbs. and 2½ tons capacity.

J. F. Wilms, Dacoma, Okla., wants gasoline commercial cars, various weights, to sell at $800 to $1500.

Keeling Garage, Wall Street, Paris, Tex., wants gasoline and electric cars of 3 to 5 tons capacity.

Wm. D. Parker, Box 13, Stephens City, Va., wants gasoline commercial cars of various sizes and prices.

Owens & Laws, 285 N. Thomas Street, Pomona, Cal., wants gasoline cars of 1 and 2 tons capacity, to sell at $1000 to $2000.

Werber Motor Truck Company, 1109 Pine Street, St. Louis, Mo., wants gasoline cars of 1000 to 2000 lbs. capacity, to sell at $1000 to $1800.

Texas Garage, 2317-2319 G Street, Galveston, Tex., wants electric commercial cars of various sizes and prices.

James Taylor, 6118 Pine Street, Phila., Pa., wants gasoline commercial cars of various sizes and prices.

Frank B. Heathman Motor Company, 130 N. Main Street, Dayton, O., wants gasoline and electric cars of 1500 lbs. capacity, to sell at $1000 to $2000.

Diamond Motor Repair Shop, South Street & Diamond Avenue, New Castle, Pa., wants gasoline and electric cars of 1½ to 5 tons.

Standard Garage, 323 W. Main Street, Ottawa, Ill., wants gasoline commercial cars of 500 lbs. to 2 tons; selling price $800 to $2000.

Geo. W. Davidson, 259 Glen Street, Glens Falls, N. Y., wants gasoline cars of small size to sell at $500 to $1000.

Jos. L. Ellis, Harwich Port, Mass., wants gasoline cars of 1000 to 1500 lbs. capacity, to sell at $900 to $1500.

Janssen & Mertes, LaMonte, Mo., Wants small gasoline commercial cars.

Kansas City Carriage & Wagon Company, 237-238 N. 4th Street, Kansas City, Mo., wants gasoline cars of 2, 4 and 6 tons.

Sawtelle Garage, 116-20 N. 4th Street, Sawtelle, Cal., wants gasoline commercial cars of 1 ton, to sell at $1200 to $1500.

Imperial Garage Company, Clinton Street, Hoboken, N. J., wants commercial cars of all sizes.

W. E. Thioshu, Sheldon, Mo., wants 1-ton gasoline commercial cars, to sell at $700.

L. F. O'Donnell, 315-17 E. State Street, Jacksonville, Ill., wants gasoline commercial cars of 600 to 1000 lbs. capacity, to sell at $500 to $850.

Dakota Welding & Manufacturing Company, 201 Fifth Street, N., Fargo, N. Dak., wants cars of various sizes.

Fred M. Robinsen, Philip, S. Dak., wants commercial cars of various sizes.

Oscar & Flom Auto Company, 116 N. Water Street, Stoughton, Wis., wants 1000 to 2000 lbs. gasoline cars, to sell at $500 to $1200.

Golden Belt Auto Company, 210 Poyntz Avenue, Manhattan, Kan., wants gasoline cars of 1000 to 1200 lbs., to sell at $600 or $700.

Glover Auto Company, New Richmond, Wis., wants 1½-ton gasoline cars, to sell at $1500.

W. A. Gray, Coleman, Tex., wants gasoline commercial cars of 1, 1½ and 2 tons capacity.

Knowlan Machine Shops, 306 E. Juan Linn Street, Victoria, Tex., wants gasoline cars of various sizes and prices.

Automobile Supply Company, Miami, Ariz., wants gasoline cars of 1000 lbs. to 3 tons capacity, to sell at $1000 and up.

Franklin Square Garage Company, 3 Allen Court, Worcester, Mass., wants gasoline and electric commercial cars of 1 to 3 tons capacity.

Standard Wagon & Auto Company, 404 Prospect Street, N. W., Cleveland, O., wants gasoline and electric cars of 1500 lbs. to 5 tons capacity.

Keystone Auto Garage, Charleroi, Pa., wants gasoline commercial cars of 1000 to 4000 lbs. capacity, to sell at $800 to $1500.

F. I. Blaisdell, Jeffersonville, Vt., wants a light farmer's car, to sell for $500 or $600.

20th Century Automobile Company, 1700 Broadway, cor. 54th Street, New York City, wants gasoline and electric cars of various sizes and prices.

Frank R. Foster, 19 Auburn Street, Woodstown, N. J., wants gasoline cars of ½, 1 and 2 tons capacity.

Louis Bellinger, Main Street, Worcester, N. Y., wants gasoline commercial cars of ¾ and 1½ tons capacity.

Samuel H. Grossman, 323 Jersey Street, Harrison, N. J., wants gasoline and electric commercial cars of 1500 lbs. and 3 tons capacity, to sell at $1000 and $3000.

Eureka Auto Company, 520 Second Street, Eureka, Cal., wants cars of various sizes and prices.

Henry U. Whipple, Highland Avenue, Monticello, N. Y., wants gasoline commercial cars of 1000 to 3000 lbs. capacity, to sell at medium price.

City Auto Company, Wood Street, Wilkes-Barre, Pa., wants gasoline commercial cars of 1000 to 2500 lbs. capacity, to sell at $1000 and up.

Carlson Bros., Beresford, S. Dak., want 3-ton gasoline and electric cars to sell at $2000.

E. H. Peshak, 130 S. Spring Street, Beaver Dam., Wis., wants gasoline cars of 500 lbs. to 2 tons capacity.

J. H. Hecker, Box 127 Covington, O., wants cars of various sizes and prices.

Deakin's Garage, Main & Stevens Streets, Missoula, Mont., wants gasoline and electric cars of 500 lbs. to 1000 lbs., 3, 4 and 5 tons capacity.

F. E. Turner, Harvard, Neb., wants gasoline and electric commercial cars, to sell at $1500 and under.

Pocono Pines Garage, R. E. Miller, Manager, Pocono Pines, Pa., wants gasoline commercial cars of 1500 to 4000 lbs. capacity, to sell at $800 to $1800.

Greenbay Avenue Garage, 1459-61 Greenbay Avenue, Milwaukee, Wis., wants gasoline and electric cars, 800 to 1500 lbs. capacity, to sell at $600 to $1000.

Kalispell Auto Company, 18 First Avenue, E., Kalispell, Mont., wants gasoline commercial cars.

Knox County Auto Company, 52 Main Street, Thomaston, Me., wants gasoline and electric cars of 2000 lbs. capacity, to sell at $600 to $800. E. S. Stearns, Manager.

City Hall Garage, Inc., 25-29 Union Street, Paterson, N. J., wants gasoline cars of 1000 lbs. to 5 tons capacity, to sell at $500 and up.

Park Avenue Garage, 355-57 Park Avenue, Newark N. J., wants 1, 2 and 3 ton gasoline commercial cars, to sell at $1600 and up.

New Bon Ton Garage, 2714 Atlantic Avenue, Atlantic City, N. J., wants gasoline and electric commercial cars of various sizes.

J. J. Sullivan & Sons, 457 W. 164th Street, New York City, wants gasoline and electric cars of all sizes.

Monroe Auto & Repair Company, 202 Monroe Street, Brooklyn, N. Y., wants 500 lbs. to 3 ton gasoline cars, various prices.

A. S. Allen, 400 Totowa Avenue, Paterson, N. J., wants gasoline and electric cars of various sizes and prices.

E. D. Richardson, Cawker, Kan., wants gasoline commercial cars of 1000 to 3000 lbs. capacity, to sell at $500 to $1500.

B. Rickard, 12-14 Pask Street, Jersey City, N. J., wants gasoline commercial cars of 700 lbs. to 3 tons capacity, to sell at $600 to $2000.

H. C. Ryon, 700 Tallman Street, Syracuse, N. Y., wants gasoline and electric commercial cars of 1500 lbs. to 5 tons capacity.

I. X. L. Motor & Engineering Company, 1099-1101 Genesee Street, Buffalo, N. Y., wants electric and gasoline cars of various sizes, to sell at $750 to $1000.

Chester C. Tribble, Yoakum, Tex., wants gasoline commercial cars of various sizes, to sell at $1000 to $1500.

H. H. Young, 19 Edward Street, Binghamton, N. Y., wants gasoline and electric cars of various sizes and prices.

Note.—Inquiries of the above character will be inserted for our subscribers without charge of any kind.

This service, however, is only for subscribers and those wishing to take advantage of it and who are not subscribers, should send their subscription order and remittance with the necessary data for the notice. *Advertisement.*

THE COMMERCIAL CAR JOURNAL

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SUBSCRIPTION RATES

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., OF THE COMMERCIAL CAR JOURNAL

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Known bondholders, mortgagees, and other security holders, holding one per cent or more of total amount of bonds, mortgages, or other securities:
NONE.

(Signed) C. A. MUSSELMAN, Business Manager.

Sworn to and subscribed before me this 2d day of October, 1912.

(Signed) HARRY SMITH, Notary Public.
(SEAL) (My commission expires February 21, 1915.)

Note:—In regard to Section 2 of the Act mentioned above, the Chilton Company does not accept payment, directly or indirectly, for any editorial or other matter printed as news.

WHERE ARE THE DELIVERY CAR STARTERS?

FROM time to time we have agitated the question of why engine starters are not supplied on commercial cars. The slowness of the makers in supplying such a necessary feature is hard to understand. Is it because they are so occupied in filling orders that they have no time to improve their product,, or is it because the user is not yet wise and has not demanded the starter?

Pleasure cars are now supplied with the starter as a necessary part, but is it necessary? No, but it is extremely convenient. It is a luxury which everyone who owns a car appreciates, but on a truck it is a necessity. With drivers it is customary to let the engine run at all short stops, and often at long ones. In congested traffic, when held up at railroad crossings and in freight yards, the trucks may be seen standing from two minutes to half an hour at a time with the engine running. These engines are burning gasoline, and gasoline spells money, and before another year it looks as if it would spell money in capital letters. With the price of gasoline soaring higher every year, the matter of the fuel consumed while engines are running idle becomes a consideration, at least to the business house using a commercial car. Although the wear and tear on the engine in a year's time amounts to something, it is secondary in importance to the gasoline cost. True, the engine is usually throttled to the low point, but not always, and even when so throttled the fuel consumed amounts to surprising figures in a year's time.

In the coal business, where trucks are loading and unloading for a considerable period, the idle running of the engine amounts to several hours per day. In one particular instance, where a vehicle was timed for an entire month it amounted to 101 hours, 23 minutes, which at this rate for a year amounts to the astonishing figures of 1,216 hours, or the equivalent in 10-hour working days to 121 days, or practically five working months of 25 days each. In this instance the motor was not kept running the entire time, but it is safe to say that it was 50 per cent. of the time that the truck was standing idle, in other words, a time equal to two months and a half of continuous running for the engine, with nothing accomplished but the burning of gasoline and wear and tear on the parts.

Even where the stops are short, from two to three minutes, it has been found that the average delivery car engine is allowed to run in the neighborhood of 20 to 25 hours per week. The idle time of running during an entire year amounts to almost three months. With an engine starter nearly all of this waste is done away with. If the truck can be started from the seat by simply pulling a lever, pushing a pedal or button, the driver will allow the engine to stop when the car comes to a stand. Under present conditions time is often lost by excessive cranking, if the carburetor is not in adjustment, or the ignition or timing just right, and the driver, knowing this, hesitates to stop the motor for fear he may have trouble in starting it again. In winter, cranking the engine necessitates getting into the mud, and although for short stops it would not be necessary to run the engine in order to prevent freezing, still the engine is allowed to run because the driver does not want to get into the street to crank it.

We have been advocating the manufacture of the engine starter as a part of the engine, but most of the devices are still in the nature of accessories which must be applied to the

finished car. We appeal to the manufacturers to supply commercial cars with starters forming a part of the standard construction. This will be the eventual outcome, and the maker who incorporates a satisfactory starter as a part of the car will have an advantage over his competitors.

TIRE WIDTHS PER TON-LOAD SHOULD BE STANDARDIZED AS A MEANS OF PREVENTING ADVERSE LEGISLATION

MASSACHUSETTS, New Jersey and New York have attempted to pass prohibitory laws in regard to the weight of vehicles which may be driven on the improved highways of those states. In each case the laws were of such a nature as to work a hardship on heavy truck users, and would also have an injurious effect on the automobile makers and the tire manufacturers. Tire equipment would have to be entirely changed from the sizes for given weights as used at the present time.

We do not deplore the fact that the regulation of vehicle weight is being attempted, for such regulation is doubtless necessary, and will certainly be more necessary as time goes on, but we do deprecate the passing of laws which are not in conformity with actual practice, and which do not take into consideration present working conditions.

The recent proposed legislation which the State Highway Commission of New York has under consideration as an amendment to the present highway law, limits the weight of the truck and load to 8,000 lbs. per axle even on 10-inch tires. As a four-ton truck chassis weighs approximately four tons, this limits the size of trucks which can be driven in the state to four tons, and as many five, six and seven-ton trucks are in daily use and showing great economy, the passage of such a law would greatly hinder many large business firms, and would certainly do great damage to the automobile industry.

The prohibiting of caulks, spikes, etc., on the tires is necessary, as these tear up the macadam.

Regulations must and soon will be passed to govern vehicle weights when operated on improved highways. Under these circumstances it is of great importance to the truck manufacturers that the laws be of such a nature that owners can continue to use their present equipment. As the proposers of these laws so far have shown a tendency to entirely disregard current automobile practice which has been proven by the test of use to be practical, it is suggested that this matter be taken up by the N. A. A. M. and standardized as far as possible. Standardization of tire widths per ton of load would also be beneficial to the truck makers and users. The N. A. A. M., through its committees, can determine what are the best widths of tire which can be used per ton of load, and make a recommendation that, as far as possible, the standard practice decided upon by them be incorporated in the laws as proposed before the various state legislatures.

The Steel and Rubber Markets

STEEL CONTINUES IN ACTIVE DEMAND

The unfilled orders of the United States Steel Corporation on November 1st were 7,852,882 tons, an increase of 258,502 tons since October 1st, and 3,710,927 tons more than at the same date last year, and the largest amount of unfilled orders in the history of the company with the exception of two months of 1906.

This is equal to six months' product. All the principal independent companies report orders for 6 months or more ahead.

In spite of the activity of the demand, steel prices are somewhat lower than a month ago. This is probably due to the fluctuation of the stock market, which at this writing is very much depressed. The statement by the United States Steel Corporation of the increase in unfilled orders which was published on December 10th, had a marked effect on the stock market, checking the downward plunge and causing prices to react so that most of the losses for that day were regained. Steel quotations of December 11th are:

STEEL PRODUCTS PRICES

Bessemer steel, per ton, mill	27 50@28 00
Open hearth, per ton, mill	28 00@29 00
Sheet bars, per ton	29 00@30 00

STEEL BARS

Steel, soft base, half ex., tidewater	1 56@1 61

The above prices are at tidewater in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., $2.00 per ton additional is charged, and less than 1,000 lbs., $8.00 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots $2.00 per ton higher.

Gauge—	Black.	Galv.	Gauge—	Black.	Galv.
Nos. 22 & 24	2 10	3 05	No. 28	2 25	3 40
Nos. 25 & 26	2 15	3 15	No. 29	2 30	3 60
No. 27	2 20	3 25	No. 30	2 35	3 80

RUBBER UP TO $1.12

During the past month the rise in the market price of rubber has been steady and uninterrupted. An advance of 8 cents per pound is the record of the month. The demand has been active and continues to increase, and the tendency of prices is still upward. The London market for both Brazilian and plantation grades is firmer than for some time past, and dealers are buying freely in both New York and London. On December 11th the following prices were quoted on the New York market:

Up-River—			
Fine	1 11	@1 12	
Coarse	85	@ ..	
Island, fine	1 00	@1 01	
Coarse	58	@ 59	
Cameta	59	@ 60	
Caucho—			
Ball	86	@ ..	
Centrals—			
Corinto	80	@ 81	
Esmeralda	79	@ 80	
Guatemala, slab	56	@ 57	
Mexican—			
Scrap	79	@ 80	
Strip and scrap	77	@ 78	
Guayule	Nominal		
Balata, sh't	76	@ ..	
Ciudad, bl'k	53	@ ..	
Trinidad, bl'k	Nominal		
Africans—			
Masai red	97	@ 98	
Red Congo	97	@ 98	
B'k Congo	96	@ 1 00	
Soudan—			
Niggers	86	@ 87	
Accra, lb.	47	@ ..	
Gambia, prime	68	@ 69	
East India—			
Smk sh'ts	1 13	@1 14	
Ceylon, bls. & sh'ts	1 08	@1 09	
Pale crepe	1 09	@1 10	
Borneo I	62	@ 63	
Borneo II	50	@ 52	
Borneo III	42	@ ..	
Pontianac,			
Prime plantation	7	@ ..	
Palembang	7	@ ..	

London, Dec. 10.—Closing: Up-river fine, 4s 8¼ d; up-river coarse, 3s. 6½d; pale crepe, 4s 6¼ d, basis first latex. Prices are for spot and nearby. Market closed quiet but firm.

SCRAP RUBBER

Tires—	
Automobile	9⅞@10⅛
Bicycle pneumatic	5⅛@5¼
Wagon and carriage solid	9¼@9¼

INFORMATION BUREAU

WHAT WOULD YOU LIKE TO KNOW? FREE SERVICE

There are many important questions about commercial cars, or their use or care, upon which we feel sure our readers would like to be more fully advised.

Write us stating fully what you want to know.

Address Information Bureau,

COMMERCIAL CAR JOURNAL, Market & 49th Sts., Phila., Pa.

PNEUMATIC VS. SOLID TIRES FOR DELIVERY CARS

[224] Is pneumatic tire equipment preferable to solid tires for commercial trucks having a carrying capacity of 1500 lbs.? And why?

Should front and rear tires be of the same size?

ALLENTOWN, PA. WM. G. WALP.

Just what should constitute the proper tire equipment for a light delivery wagon will depend to some extent upon the type and make. Should the vehicle be a converted touring car, it is absolutely essential that pneumatic tires be used, but on the other hand, should the machine be a legitimate vehicle designed for business purposes, the proper tire equipment will depend upon two factors,—speed and design, particularly of the final drive to rear wheels. Where a speed of more than 18 m. p. h. is desired, the pneumatic tire will probably be the only one which will fill requirements. The use of solid rubber tires requires substantial construction throughout, simple and durable adjustments, larger wheel diameters, longer springs, and have proved more satisfactory on vehicles using the double side chain drive than a form of shaft drive to a live rear axle. If it is decided to employ solid tires, we recommend that the rear or driving wheels be at least 2 in. more in diameter than the front, and that the governed speed of the vehicle be reduced so as to not exceed 20 m. p. h. Vibration is the cause of much mechanical trouble, and the lessening of it through the use of pneumatic tires, often more than offsets the increased tire cost.—Ed.

EFFICIENCY OF CATERPILLAR TRACTOR

[225] I am very anxious to gather all the information possible as to the efficiency of the endless belt, or caterpillar movement, applied to locomotion. I doubt whether I have used the technical terms to describe what I am interested in—what I mean is: the transmission of propelling power through two or more sprocket wheels between three and four feet distant, conveying a belt or chain upon which rests the whole weight of the machine, thereby applying the traction power over a space of the same distance.

WATERBURY, CONN. A. M. JAQUESS.

Very little has been published relative to what is called the caterpillar traction engine, but from the available information it would seem as though the efficiency of this form of transmission was exceptional, owing to the high tractive surface in proportion to its weight and a low weight in proportion to power. The machine is said to be able to ascend gradients of 1 in 1½ light and has hauled loads up gradients of 1 in 3. We believe there are probably between one hundred and fifty and two hundred tractors of this type in use in this country, and they are of particular value in desert or mountainous countries or in plowing or logging work. The Engineering Department of the city of Los Angeles, Cal., have about thirty of the machines in use for hauling material and supplies for the aqueduct which is being built across the desert, and it is quite likely that much information could be secured from them. The manufacturer of this machine is the Holt Manufacturing Company, of Spokane, Washington, formerly the Holt-Caterpillar Company, of Peoria, Ill.—Editor.

TWO-TON FOUR-SPEED TRUCKS

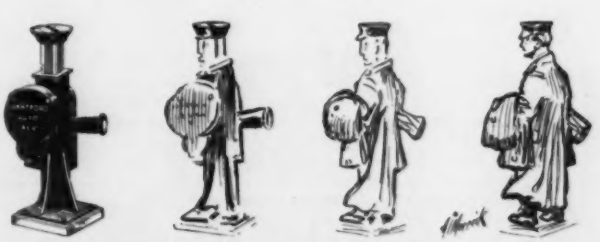
[226] Please give the names of commercial car makers who have a two-ton truck with 40 h. p. engine with four speed transmission.

ROCHESTER, N. Y. PROSPECT.

The following firms manufacture two-ton commercial cars with four speed transmissions. The horsepowers are given by the S. A. E. formula—Cass Motor Truck Company, Port Huron, Mich. (29 h. p.); Jarvis Machinery & Supply Company, Huntington, W. Va. (26 h. p.); Kelly-Springfield Motor Truck Company, Springfield, O. (31 h. p.); Kissel Motor Car Company, Hartford, Wis. (32 h. p.); Lauth-Juergens Motor Car Company, Fremont, O. (32 h. p.); General Motors Truck Company, Detroit, Mich. (26 h. p.).—Ed.

SOLUTIONS FOR ACETYLENE GENERATORS

It sometimes happens that the water in acetylene generators and piping freezes. Calcium chloride in the water cannot be recommended, as in its usual form it contains acid, which has an action and chokes up the gas passages. Denatured alcohol up to as high as 25 per cent. may be used without affecting the lights. There is very little loss from evaporation. Fifteen per cent. alcohol and ten per cent. glycerine has been used, but alcohol alone is to be preferred. If calcium chloride is used it must be pure. A solution of 20 parts to 80 of water freezes at about 5 deg. F. above zero, but even less can be used as the interior of the generator does not usually get that low.



The Evolution of the Auto Jack

Convention of the N. A. A. M. at Detroit

THE National Association of Automobile Manufacturers held their convention at Detroit, Mich., on November 13, 14, 15 and 16, at the Hotel Ponchartrain. The following were present: W. E. Metzger, president; S. D. Waldon, W. C. Leland, W. T. White, Roy D. Chapin, Alfred Reeves, L. H. Kiddredge, Hugh Chalmers, H. H. Rice, treasurer; G. W. Bennett, S. A. Miles, general manager; J. S. Marvin, general manager of traffic department; H. W. Perry, secretary of Commercial Vehicle Committee.

The following were admitted to membership: August Becker, of the Lippard-Stewart Motor Car Company, Buffalo, N. Y.; P. D. Wagoner, General Vehicle Company, Long Island City, N. Y.; Horace S. Diller, Lauth-Juergens Motor Car Company, Fremont, O.

The association has in contemplation the promotion of a local show in Pittsburgh to fill the vacancy on the local show circuit caused by the inability of the two local associations of dealers to agree on an exhibition in which the united trade may take part. The association is also in communication with the director of exhibits of the Panama-Pacific Exposition with a view to taking over and allotting the space to be devoted to the exhibition of motor cars.

In view of the cancellation of an agreement heretofore existing between the American Automobile Association and the Manufacturers' Contest Association, the National Association went on record as being willing to appoint a committee to co-operate with the A. A. A., under the direction of whose contest board racing and competitive tours are conducted.

Freight Congestion

The committee gave considerable attention to the traffic affairs of the industry and decided to open a branch of its traffic department in Detroit to facilitate the work of the department in respect to the car supply for shipments of automobiles from the factories and in other ways.

Freight congestion, car shortage and multiple shipping problems were freely discussed and at the Thursday evening banquet car promises were sewed up in the nature of a farce to the invited railroad officials.

While it is not a matter of record it is a safe assumption that the manufacturers and the railroad officials understand one another, a little better.

Good Roads

Good roads was a topic of discussion and in consequence real action on the situation which is especially vital to Michigan may be anticipated.

The following resolutions were adopted by the Executive Committee:

Body-Weight Allowance Resolution

Whereas, it seems desirable that allowances which may be made for weights of bodies on motor trucks without reducing the rated allowable freight carrying capacity of the chassis should be sufficiently large to embrace all ordinary types of bodies commonly used in the different trades employing power vehicles, be it

Resolved, that the minimum scale of body weight allowances based on stake bodies, as adopted at the March meeting of the National Association of Automobile Manufacturers, be revised in accordance with the following scale representing approximate averages of weights of all styles of bodies commonly fitted to chasses of the different capacities, to wit:

Load Capacity (pounds)	New Body-Weight Allowance (pounds)	Former Body-Weight Allowance (pounds)
1000	600	500
1500	750	
2000	900	600
2500	1000	
3000	1050	700
4000	1200	800
5000	1350	900
6000	1500	1000
7000	1600	1100
8000	1700	1200
9000	1750	1300
10000	1800	1400
12000	1900	1600
14000	2000	1800
16000	2100	2000
18000	2200	2200
20000	2300	2400

Demonstration Charges Based on Operating Costs

Theoretically, the cost per ton of motor trucking should decrease as the size of the truck increases, and logically, any schedule of charges for demonstrating motor trucks should bear a definite relation to the actual cost of operation and maintenance. Such charges should also be so fixed that the cost of doing a given amount of work will be less with the power vehicle than with horses and wagons.

The most elaborate tables of truck operating costs are those issued by the Hewitt Motor Company and the Knox Automobile Company. They agree closely in the average per diem costs of motor trucks from two to five tons capacity. These costs are shown in the appended table in columns 2 and 3, together with a schedule, in column 4, of uniform approximate average costs for all truck sizes. The costs are also plotted in the lower curves of the accompanying chart.

The work done by each size of truck is shown in ton-miles in column 6. The ton-mile capacity of a truck in a working day is assumed to be the tonnage rating of the vehicle (column 1) multiplied by its speed in miles per hour (column 5) times one-half the number of working hours, that is 5. The miles per hour are the N. A. A. M. standard speed ratings. Five hours is taken as the total daily running time, as in general trucking service about one-half of the ten-hour day is consumed in waiting for loading and unloading and other delays.

Dividing the daily cost of operation by the ton-miles of work performed, gives the ton-mile cost in cents shown in column 7. It is noteworthy that the rate drops gradually from the one-ton size to the five-ton size, and then gradually increases to the ten-ton size.

As nearly as can be calculated from information at hand, the cost of doing work with horses is as follows:

Cost of Trucking With Horses

Tons	Team (horses)	Daily Rate	Miles per Working Day	Ton Miles	Ton-Mile Rate (cents)
1	1	$5.50	16	16	34.37
2	1	6.50	16	32	20.31
4-5	2	8.50	12	48-60	17.70-14.16
8-10	4	17.50	12	96-120	16.35-14.58

According to this table based on statements furnished by professional truckmen it costs twice as much to do work with horses as with motor trucks, even allowing only five hours running per day for the power vehicle. The horse figures show the average maximum day's work for animals, but if the waiting time of the motor truck is cut down one-half by quick loading methods its work capacity is increased one-half and the ton-mile rate decreased proportionately.

Daily Cost of Motor Truck Operation and Proposed Scale of Demonstration Charges With Ton-Mile Rates Based on N. A. A. M. Speed Ratings

1	2 and 3		4	5	6	7	8	9
Truck Capacity (tons)	Average Operating Cost per day (Hewitt)	(Knox)	Approximate Average cost (per day)	N. A. A. M. Speed Rating (M. P. H.)	Ton-Miles per day 5 hours' running	Rates per Ton-Mile (cents)	Scale of 125% of Operating cost (per day)	Rate per Ton-Mile (cents)
½	.....	.....	.....	16	40	.....	$10.00	25.00
1	$8.58	.....	$8.50	15	75	11.33	10.00	13.33
1½	9.50	.....	9.50	14	105	9.04	11.50	10.95
2	10.53	$10.60	10.50	13	130	8.07	13.00	10.00
2½	11.48	.....	11.50	12	150	7.66	14.00	9.33
3	.....	12.20	12.25	11	165	7.42	15.00	9.09
3½	13.18	.....	13.00	10½	183¾	7.07	16.00	8.7
4	.....	13.80	14.00	10	200	7.00	17.00	8.5
4½	14.84	.....	15.00	9½	213¾	7.01	18.00	8.3
5	.....	15.00	15.50	9	225	6.88	19.00	8.4
6	.....	.....	16.50	8	240	6.87	20.50	8.54
7	17.23	.....	17.25	7	245	7.04	22.00	8.97
8	.....	.....	17.75	6	240	7.39	23.00	9.58
9	.....	.....	18.25	5½	247½	7.33	24.00	9.69
10	18.50	.....	18.50	5	250	7.40	25.00	10.00

If it is conceded that the charges for demonstrating motor trucks should be higher than the actual cost of operation, it is found that a schedule one-quarter higher gives the scale shown in the dotted line in the chart, ranging from $10.62 a day for a one-ton truck to $23.12 a day for a ten-ton truck.

As this is an awkward scale of dollars and cents, the scale shown in the solid line, ranging from $10 a day for a one-ton truck to $25 a day for a ten-ton truck, has been adopted by the N. A. A. M.

Resolution on Demonstration Charges

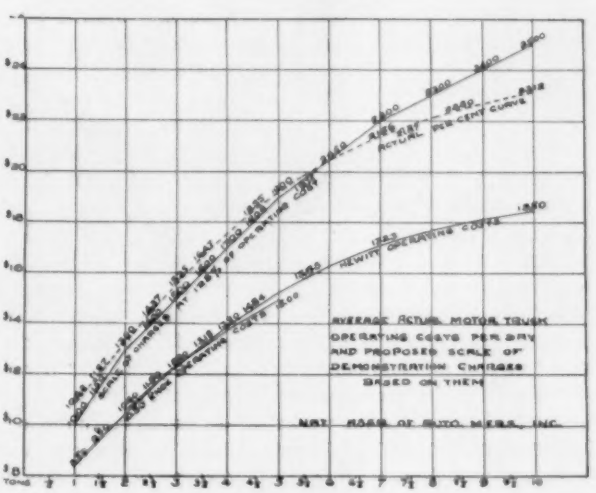
Whereas, it seems desirable that charges to be made for demonstration of motor trucks should bear a close relation to the actual normal cost of operation of the vehicles and that the rate per ton mile of work done should decrease as the capacity of the unit increases.

Resolved, that the scale of demonstration charges adopted at the June meeting of the National Association of Automobile Manufacturers be revised as follows:

Truck Capacity (tons)	Approximate Average cost (per day)	New scale of Demonstraton Charges (per day)	Former Scale of Demonstration Charges (per day)
½		$10	$10
1	$8.50	10	10
1½	9.50	11.50	
2	10.50	13	15
2½	11.50	14	
3	12.25	15	20
3½	13.00	16	
4	14.00	17	25
4½	15.00	18	
5	15.50	19	30
6	16.50	20.50	30
7	17.25	22	35
8	17.75	23	35
9	18.25	24	40
10	18.50	25	40

Papers Presented

S. A. Miles presented a paper on good roads; Hugh Chalmers on selling problems; G. M. Bennett, vice-president; Willys-Overland Company, on multiplicity of models; yearly models, by H. O. Smith, of the Premier Motor Manufacturing Company; "The Commercial Car," by S. D. Waldon, of the Packard Company; "Relation of Volume of Motor Carriage Business to Volume of Commercial Car Business," by David Beecroft, and "Injudicious Methods of Selling Commercial Vehicles," by M. L. Pulcher, of the Federal Motor Truck Company.



The Banquet

Fun, and lots of it, prevailed at the banquet. A quartet arrayed as railroad employees performed for the especial benefit of the railroad officials. Among the speakers were President William E. Metzger, Luman W. Goodenough, John C. Wetmore, Hal H. Smith, George T. Moody and James Keena. Special guests included Edsel B. Ford, A. B. Atwater, assistant president of the Grand Trunk system; J. S. Bartle, assistant traffic manager of the Atcheson, Topeka and Santa Fe road; W. C. Rowley, general freight agent of the Michigan Central; E. B. Boyd, assistant vice-president Missouri Pacific; Nat Duke, assistant traffic manager of the Lackawanna road, and George C. Conn, vice-president and traffic manager Pere Marquette Railroad.

STANDARD MOTOR TRUCK COMPANY, of Detroit, Mich., has been organized by Howard A. Wilcox and W. K. Ackerman, both of whom were formerly connected with the Reliance Motor Truck Company, now a part of the General Motors Truck Company, and also with the Kelley Motor Truck Company. Mr. Wilcox is president, and Mr. Ackerman is secretary of the new company, which will manufacture a three-ton truck.

Trucks Prove Economical in Coal Delivery

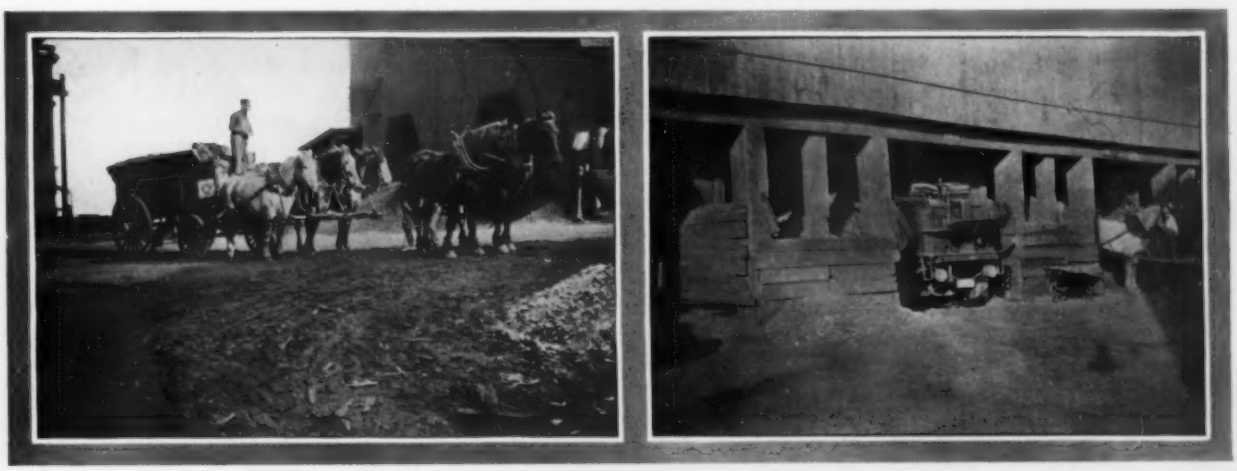
Special Bodies—Quick Loading and Unloading Devices—Features of Their Use

BY E. S. FOLJAMBE

The advent of the motor driven coal wagon is comparatively recent. Boston is perhaps the largest user of motor coal wagons; in that city there are at the present time nine companies regularly using motor trucks for delivery. Among these, the Cousens Coal Company may be spoken of as among the pioneers having put its first truck in service in July, 1910.

Coal lends itself readily to handling by commercial cars, and there is no question but that the number of motor driven trucks which will be used for the delivery of coal, will increase by leaps and bounds within the next few years. The average speed of a horse coal wagon of 5 tons is less than 2½ miles per hour, and during the winter season such loads are impossible, extra horses have to be used, and the speed is even less. Great difficulty is often experienced in getting across sidewalks and into and out of driveways, especially at private houses where adequate arrangements are not always made. It is not at all unusual in the winter for drivers to dump the load in the street, and the purchaser is forced to hire men with baskets or wheelbarrows to get it in, owing to the inability of the horses to get the wagons up steep inclines or through muddy places. The loads carried by the horses are about all they can handle under favorable conditions, and the difficulty which they have as soon as the pavements and streets become slippery or blocked with snow is a matter of common information. Even in the loading pockets themselves there are often rather stiff grades which must be negotiated in reaching the street. Under these conditions, two and sometimes four extra horses are provided for the sole purpose of pulling the loaded wagons up to the street. In an accompanying illustration is shown a 3-horse wagon of the Cousens Company with two horses just being attached preparatory to hauling the wagon up the short incline to the street. It is needless to say that motor vehicles do not need assistance, and go up these grades under all weather conditions, without trouble.

The Cousens Company found the first truck, which was a couple-gear, 4-wheel driven electric, so satisfactory that in June of the following year, 1911, they purchased another machine. At the present time they are operating five of these couple-gear electrics, and one 5-ton gasoline truck. Mr. Cousens made the statement that the trucks were very satis-



With and Without

The illustrations above show, in a very striking manner, one of the disadvantages of the horse-drawn vehicle. On account of a short incline, the three-horse team had to be given assistance, while the truck can climb the same with ease. At the right is shown an electric truck loading by the overhead method

factory, and that they would not care to try to do without them. Additional truck equipment will be added from time to time. These trucks are used largely for long haul delivery to the residential sections, Brookline and the Newtons. Much of this territory is very hilly, and some of the mansions are located almost inaccessibly. It was found that the trucks were very successful in climbing the grades, and as special dumping bodies are provided, loads can be discharged in the minimum of time. The trucks are loaded entirely by overhead hoppers, but a few minutes being required to completely load a 7-ton truck. Under special conditions trailers consisting of the old horse drawn wagons are successfully used, thus increasing the load capacity at a single haul to 10 tons.

One of the largest coal dealers in Boston, in fact in New England, has been experimenting for some time with motor trucks, having followed closely the lead of the Cousens Company. This company is now using 4-wheel driven electrics, the front wheel driven Eldridge, and gasoline machines. All kinds of experiments have been made to test the utility of these vehicles. The 4-wheel driven electric has been used through one winter successfully, but at the present time the company is waiting for the period of heavy snows to test the 2-wheel driven vehicles, before passing a final opinion as to how much of their service they will motorize.

Each vehicle does the work of two 2-horse teams and one single horse wagon, averaging from 40 to 55 tons per day. This varies with the district, and on the very best roads 25 miles is quite common per day. Trucks are used for all of the hardest hauls, and for deliveries which must be made after 6 o'clock in the evening or at night to office buildings, thus saving the horses.

Truck Cost Compared With Horses

The following comparison with horses are from Eldridge front wheel drive and electric; these figures cover six months, driver's wages, based on 312 working days per year.

Driver @ $2.50 per day	$ 390.00
Battery replacements	213.50
Current, @ 2 cents per Kilowatt	120.00
Tires, for front wheels only	115.00
Repairs and replacements	51.50
Depreciation 10%	170.00
Liability insurance	62.50
Fire insurance	47.50
Interest on investment @ 5%	65.00
Storage rent	116.00
Total	$1351.00

It will be noticed that the tire renewals are low, as there is only one set of rubber tires, this being on the front wheels. Charging is also rather low, being at the rate of only 2 cents per kilowatt. This item varies in different neighborhoods, but seldom exceeds 4 cents per kilowatt. Assuming the vehicles to work about 295 days out of the year, the cost per day for these machines is slightly over $9. The figures given are for an average case where conditions are favorable. The company states, however, that under no circumstances has the average cost per day exceeded $10.50, even for the 4-wheel driven machine which has been in service over a year. As it requires five horses to do the equivalent of one of these machines, a comparison can easily be made, as the cost of horses figures about $12.50 to $13 per day, which includes depreciation on the horses at 10 per cent. This is rather low, but the company in question has found that its horses last on an average, ten years. Drivers are not allowed to trot them under penalty of discharge. The animals are of good quality, ranging in price from $225 to $360 each. Taking extreme conditions, therefore, each truck is saving on an average of $2.50 per day over the cost of doing the same work by horses.

A Novel Electrical Loading Device

By means of an electrically operated chain of buckets, the coal is quickly dumped upon a slanting screen, which allows the finer material to fall through, while the proper-sized coal drops into the truck.

In connection with the Eldridge front wheel drive electric, there is the decided advantage that the old horse wagon can still be used, which is a saving of $300 or $350. The rear wheels of these wagons are in the neighborhood of 6 ft. in diameter, and fitted with heavy steel tires. The forward end under the driver's seat carries the battery, and below are the two power wheels. The writer rode on one of these machines for several miles over cobblestone pavements, and was astonished at the easy riding qualities. Casually observing one of these coal wagons from the sidewalk, it appears to be going very slowly, but in reality it is making from 4½ to 5 miles an hour. It was quite noticeable when riding on the truck that it passed all of the heavy horse traffic on the streets. The steel tires can be used in winter as well as summer, as they are not on the driving wheels, but great care has to be exercised to prevent the rear end of the machine from sliding sideways.

Novel Electrical Loading Devices

Rapid loading is a feature of the coal hauling problem. In most pockets the coal is shot into the trucks from overhead chutes, each opening being provided with a screen, so that the coal it sifted, the screenings falling to one side, and the large coal going into the truck. In an accompanying illustration is shown a special electrical loading device, which was designed and built by the large Boston coal company in question, for use where enormous piles of coal directly on the ground have to be loaded into the trucks. These coal piles are replenished by dumping cars running on a high trestle. The loader consists of four stocky wooden wheels, an inclined frame, upon which is operated by an electric motor housed in a compartment at the front, an endless chain with buckets. These buckets dig into the pile of coal, carry same to the top and dump it on a slanting screen which allows the finer material to fall to the ground, while the proper sized coal passes into the truck body. This mechanism will eat up a pile of coal in a very short time. It does the work in less than one-tenth of

Dumping Body Operated by Vertical Screw and Electric Motor

Shoveling the coal that does not go into the hole could be done away with, by means of an improvement, as suggested in the text of this article

the time in which it could be done by hand. It can be readily moved from place to place or pushed deeper into the coal pile as the coal is removed.

Hauling Records of Boston Coal Company

The New England Coal & Coke Company has in use several Alco gasoline machines, equipped with elevating dumping bodies. The following is a record of the tonnage of three of these machines:

Truck No.	Average Miles per day	Tons Delivered
50	31.3	15.5
51	39.5	16
53	42.0	18

The following is a month's record for one of these machines, giving the number of pounds carried, number of hours and minutes in service each day, cost of labor, total number of miles covered, the number of hours and minutes on the road, and the number of trips:

Date	Tonnage in pounds	Working Time in Hrs. and Min.	Cost Labor	Miles per day	Running Time in Hrs. and Min.	Trips
1	40,200	9-20	$3.75	44.0	4-55	5
3	29,800	10-20	4.06	29.0	3-32	4
4	22,100	11	3.90	39.0	4-30	3
5	37,700	10	3.90	40.0	5-40	5
6	36,500	10-10	3.90	40.0	5	5
7	38,700	10-25	3.90	42.0	4-40	5
8	37,500	9-45	3.90	44.0	5-05	5
10	36,300	10-15	3.90	50.0	6-55	5
11	38,100	9-35	3.90	40.0	5-40	5
12	36,500	10-10	3.90	36.2	5-35	5
13	35,200	8-50	3.90	48.0	6-45	5
14	35,800	9-20	3.90	62.5	7-20	6
15	44,300	9-45	3.90	42.0	4-55	5
17	35,100	8-30	3.90	42.0	4-55	6
18	43,800	9-30	3.90	52.0	5-40	6
20	41,300	10-30	4.06	42.0	6-05	5
21	35,700	8-20	3.90	42.0	4-05	5
22	39,000	8-45	3.90	36.0	4-50	5
24	35,600	9	3.90	44.0	5-35	5
25	38,200	9-15	3.90	36.0	4-45	5
26	37,000	9-10	3.90	44.0	5	5
27	40,400	9-50	3.90	38.0	4-50	5
28	37,860	9-30	3.90	44.0	5-50	5
29	26,300	8	3.90	28.0	3-45	4
Total. ...	868,960	229-15	$93.77	1004.7	125-52	119
Average	36,206	9-23	3.91	41.9	5-15	5

It will be noticed that these machines covered on an average 41.9 miles, yet the running time was only 5 hours 15 minutes, out of a total of 9 hours and 23 minutes working time, in other words the trucks were standing 44 per cent. of the total time. Undoubtedly this time could be cut down by the use of some such flexible tube in connection with the tilting body. Where the coal has to be shot a considerable distance time is necessarily consumed in propping up and supporting the metal chute over which it slides; again, time is lost in narrow alleys and in getting to the place where the coal can be discharged.

A Suggested Improvement

These fore-wheel driven electrics are of the power dumping variety, using the old horse wagons which are of the tilting body type. These are now fitted with a vertical screw and a small electric motor, so that the complete load can be raised and dumped inside of three minutes. In an accompanying view one of these vehicles is shown discharging a load into a sidewalk coal hole. In this connection, it may be well to call attention to the fact that most dumping bodies in use in coal service, might be improved by the addition of an attachable flexible discharge tube, of a diameter which would go into the ordinary coal hole. Such tubes could be quickly attached, the end placed in the coal hole, and the coal discharged accurately where desired without being thrown all over the sidewalk. The services of at least one man could then be dispensed with, as no hand shoveling of the sidewalk and gutter would be required.

Driver Should Control Loading Chute

Although overhead hoppers are used for loading, practically none of these are so arranged that the driver can load his truck by standing up and operating levers which control the chutes. By making a very few changes it would be possible to run long wooden levers in such a position that the driver himself could control the coal falling into the truck. This would not only save time, but do away with the help of one to two men.

Using the Old Wagons

There seems to be a tendency toward the use of devices which permit of using at least a part of the old equipment. In this class is the Martin Tractor of the Knox Automobile Company. This device has been described in these columns, and is more or less familiar to our readers. Briefly, it consists of a 3-wheeled machine with automobile hood, motor, driver's seat, etc., at the front, with a single wheel at the front for steering. Upon the rear end of this is placed the forward end of the vehicle to be drawn. The rear wheels of the tractor are the drivers, and during the slippery weather are provided with block rubber tires, but during seven months of the year they are fitted with steel tires. The rest of the outfit consists of the old wagon with steel tires, thus minimizing tire expense. The peculiar construction makes it possible to use comparatively light transmission parts in the tractor, as the shock of starting and stopping is relieved by the rear spring construction. For this reason it is possible to use the regular Knox transmission in these tractors, although hauling seven tons.

(To be continued.)

The Lippard-Stewart 1500 lb. Commercial Car

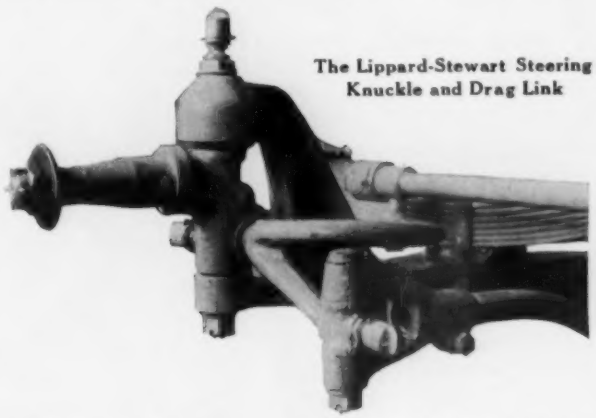
THE Lippard-Stewart Motor Car Company, of Buffalo, N. Y., is devoting its entire attention to the production of a commercial car, having a chassis of 1500 lbs. carrying capacity, and upon which are mounted various delivery car bodies of the enclosed panel, express, open box and stake types, together with bodies for ambulances, police patrols, undertakers' wagons and hotel 'buses. On account of the variation of the character of the loads carried, an option is offered between two lengths of wheel base, 115 in. and 125 in.

The power and transmission units are entirely separate, and either the motor, clutch, or transmission can readily be removed without disturbing any other part of the mechanism or the load.

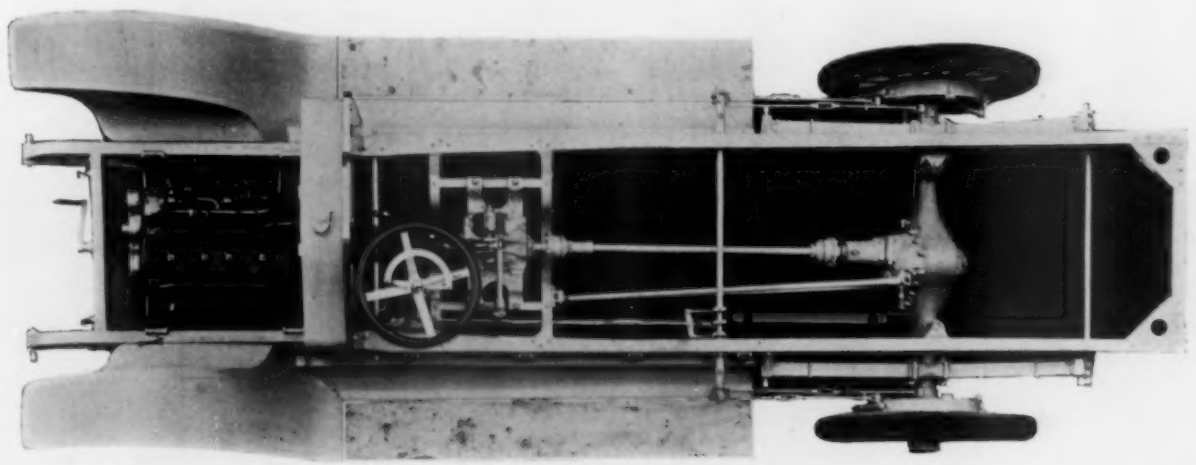
The Motor

The Continental motor of 30 h. p. is located in front, under an attractive hood of the French type, where it is easily accessible for inspection and oiling. The four 3¾ x 5¼ in. L-head cylinders are cast en bloc from a special grade of reverberatory air-furnace iron. The water jacket head is cast separately, which construction makes possible a very uniform thickness of the cylinder walls, owing to the advantage it offers in foundry work.

Pistons are 5 in. long and are accurately ground to size, so as to insure perfect fit in the cylinders. Four diagonally split eccentric rings make perfect contact with the cylinder walls. On the bottom of the pistons are five oil grooves, which thoroughly distribute the oil over the wearing surfaces. The wrist pins are made of case-hardened seamless steel tubing, and are fastened securely by means of clamps. Connecting rods are drop forgings of "I" section, and subjected to a special heat treating process. The bearings on the crank end are 1¾ in. in diameter by 2½ in. long. The crank shaft is also a drop forging and heat treated. It is supported on three nickel Babbitt bearings, the front one being 2¾ in. long, the middle 3 in. long and the rear 4 in. long, all of which are 1¾ in. in diameter. The cam shaft and cams are made integral and can be readily withdrawn by removing the gear case cover.



The Lippard-Stewart Steering Knuckle and Drag Link



The Lippard-Stewart Chassis

This view shows the method of suspending the motor, transmission and rear axle from the frame. This chassis has a capacity of 1500 lbs. and is made in 115 and 125 inch wheel-base lengths

The crank case is of the two-piece type, with all bearings supported from the upper half. The lower half serves as an oil-reservoir, and by its removal all bearings are readily exposed for necessary adjustment, which is done by means of shims of varying thickness. The supporting arms are of rigid construction and are fastened directly to the side members of the frame, eliminating entirely the use of a sub-frame.

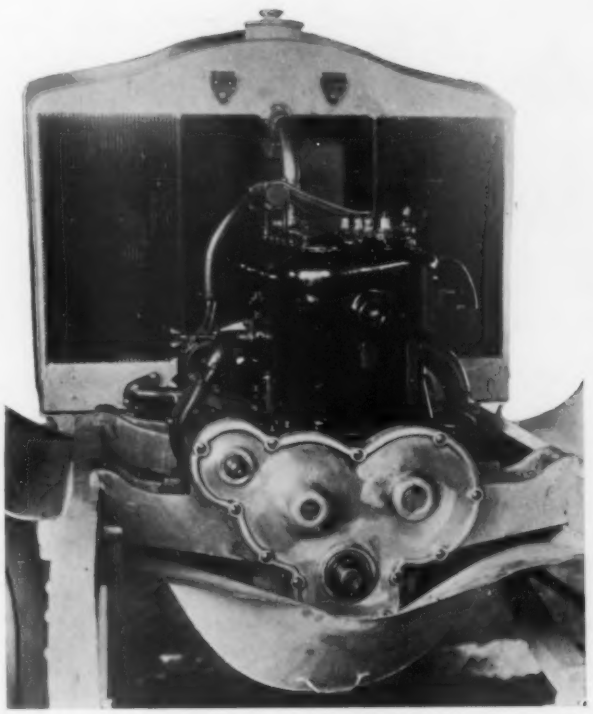
Lubrication

The motor lubrication is accomplished by means of a force feed constant level system. Plunger pumps driven from the cam shaft force the oil through copper tubes to the timing gears in the front and the main bearings in the rear, from which points it drains back to the crank case into the special troughs, where a constant level is maintained. The overflow finds its way back into the reservoir after passing through a strainer, and is pumped over again through the same course.

Cooling

Water circulation is by means of a large centrifugal pump of the double bearing type, the intake pipe of which is connected to both right and left sides of the large flat tube radiator. Instead of employing the usual belt-driven fan, the flywheel is utilized for the same purpose by fastening to its circumference a large number of blades. By placing the radia- open, and the emergency brake is adjustable for wear by a toggle lever that is mounted on the radius rod and may be changed to secure any desired clearance by changing the pin on which it is carried. The service brake is also mounted with the lever carried on a pin on the radius rod. The wheels are artillery type, of second growth hickory, 36 in. in diameter, fitted with demountable tires, the make being optional with the purchaser. The wheel base is 130 in. and the tread is 56 in.

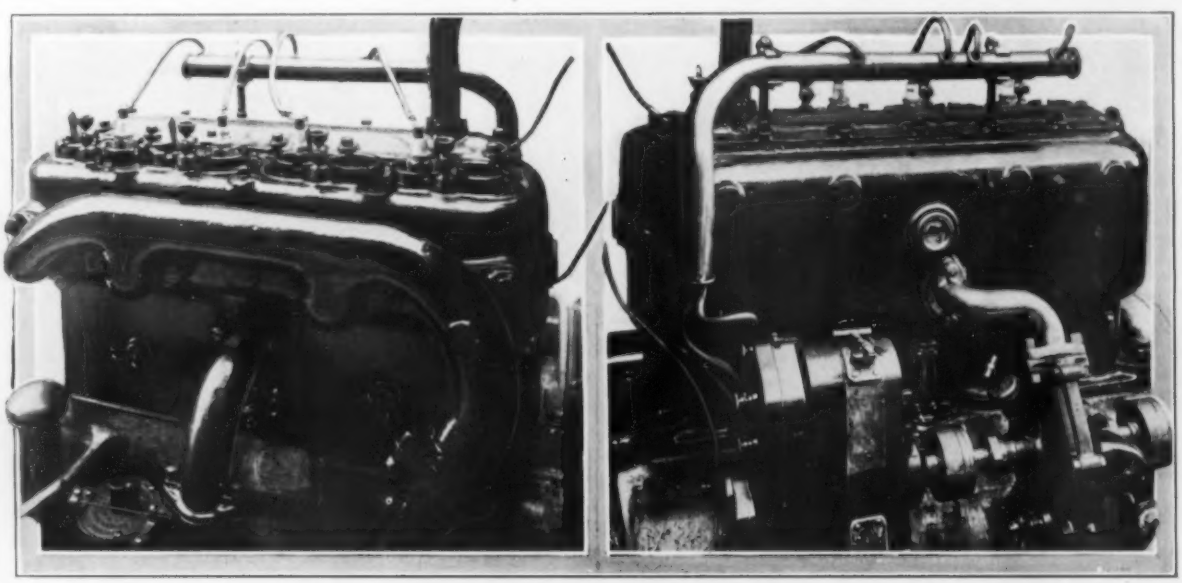
In the design provision is made for carrying a body weighing 700 lbs. and a load of 3000 lbs., the weight being 40 per cent. on the front wheels and 60 per cent. on the rear wheels. The dash is of wood. The gasoline tank is a steel cylinder under the driver's seat and has capacity of 20 gals., 3 gals. of which is reserve.



Front View of the Motor
Showing suspension brackets, removable mud pan and divided radiator

The weight of the chassis is 3540 lbs. On one running board is the tool box and on the other the battery box. The equipment includes two dash and one tail lamp. The usual jack and the tool kit are also supplied.

The chassis has a loading space back of the driver's seat of 113 in. in length and 48 in. width between wheels.



Two Views of the Continental Motor
Note the thumb-nut retained cover plates. The magneto and centrifugal water pump are mounted on the exhaust side and are connected by a flexible coupling

The Standard Three-Ton Commercial Car

An Assembly of Well-Known Standard Parts

MORE than ordinary interest attaches to the advent of the three-ton Standard commercial car, manufactured by the Standard Motor Truck Company, Detroit, Mich. The name of this new car is derived from the parts used in the construction, that is, standard parts of well-known makers; as for example, the motor is Continental, transmission Brown-Lipe, jack shaft and axles Timken.

Motor

A four cylinder, vertical water cooled engine, under a forward hood, therefore readily accessible, is employed; this supported at four points to the sub-frame, through integral arms on the motor base. As this unit is of the well-known Continental make further description is unnecessary. Bore is 4½ in., stroke 5½ in., rating 40 h. p. By detaching the radiator the complete power plant may be withdrawn from the front of the car.

Cooling and Lubrication

Cooling is by water, cylinder jackets formed integral. Circulation is induced by a centrifugal pump and all water connections are of liberal size. A four-blade fan is used, this driven through a flat belt, tension adjustable. The cellular cooler, of neat design, does not in itself touch the frame proper. It is supported at the sides by heavy flat coiled springs which absorb the shock.

Lubrication is by force feed and splash. Two plunger pumps lift the oil, one of these delivering the lubricant to the rear main bearing and the time gears, the other to the crank case, where a constant level is maintained. Both plunger pumps are driven from the cam shaft. High and low level in the crank case is denoted by a sight gage on the right side of the engine base. Grease cups are plentifully supplied.

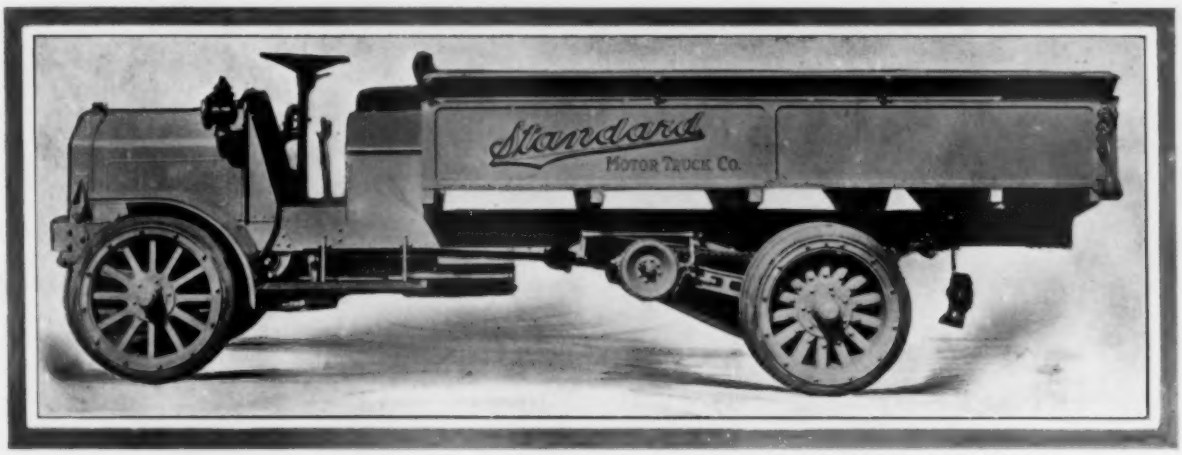
Ignition

The source of ignition is an Eisemann high tension magneto located on the right side of the motor and driven from the pump shaft. The spark plugs are located over the intake valves, the priming cups over the exhaust. A feature of the ignition system is that the advance is automatic. The only control is the gas lever under the steering wheel.

Control

Gears and emergency brake are lever operated, these levers mounted on the transmission cover and located in the center of the car. Gear shift lever is ball topped. Clutch and service brake are pedal operated.

Steering is through a worm and full gear system from the left, the 2 in. post slightly inclined so that the driver may enter the car from either side. The wheel with five-arm spider is 20 in. in diameter. Gears and shafts are formed integral, ball thrust bearings are fitted. The drag link, 1¼ in. in diameter, is fitted with 1¾ in. ball joints and spring buffers at each end and the cross connection, or tie rod, same size, is located in front of the axle.



Standard Three-Ton Truck With Flare-Board Express Body

The radiator is mounted on special brackets, which permit of easy removal. The steering gear is located on the left, with control levers in the center. The jack-shaft brake drum can be seen, as can also the adjustable radius rod

Automatic Governor

Speed of the truck is controlled by an automatic governor located at the right side forward. This operates a butterfly valve in the intake and is independent of the carburetor, which is controlled from the steering post. Normal speed is between 900 and 1000 r. p. m.

Unit Clutch and Transmission

The makers of the Standard three-ton car have selected a unit clutch and transmission to receive and deliver the effort of the prime mover. The gear box is round at the forward

end, forming a compartment for the multiple disc clutch, this working dry, as the discs are faced with Raybestos. The gear box is bolted direct to the flywheel housing, integral with the crank case.

Transmission is three speed and reverse, selective sliding gear set, all gears 3½ per cent. nickel steel, heat treated, This is of Brown-Lipe manufacture, with shafts operating in Timken roller bearings and the assembly is very compact.

Drive from the transmission to the jack shaft is through a universally jointed propeller shaft, 1¾ in. in diameter. Spicer joints at each end, these enclosed.

Timken Jack Shaft and Axles

Jack shaft is Timken make, main housing pressed steel of neat design. By removing a back cover plate the differential is easily reached and the pinion and other elements are supported in the front of the case. Bearings throughout are Timken roller. The forward sprockets on the jack shaft are designed to have the center line of the chains come over the bearings.

Final drive is through side roller chains. Sprockets on the rear wheels are bolted to the brake drums, therefore easily removed and replaced. The jack shaft is well supported in heavy brackets on the frame rails.

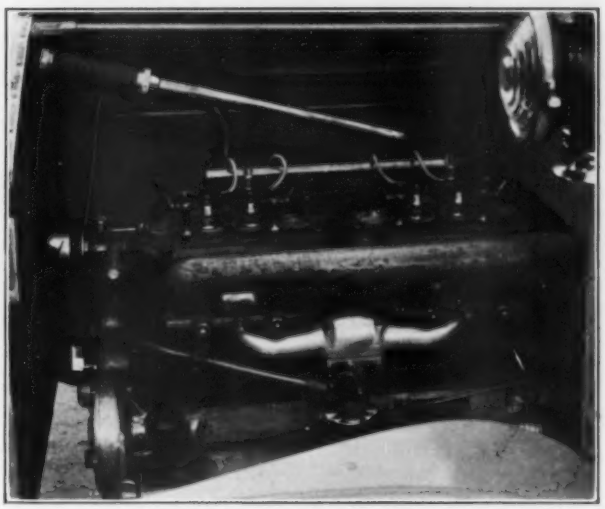
The radius rods are heavy steel castings, swivel joints at each end, the rods extending from the rear axle to the jack shaft tubes. All swivel pins are hardened and ground.

There are available in the Standard three-ton trucks, four different gear ratios for the jack shaft and two sizes of front sprockets, making a total of eight ratios between transmission and the rear wheels. The governor can be adjusted to make the maximum motor speed from 600 r. p. m. to 1000 r. p. m.

Front and rear axles are Timken make, front a semi-I-beam forging, rear 2¼ x 3⅝ in., wheel bearings Timken roller. The rear axle has a capacity of 11,000 lbs. Steering jaws and spring seats are formed integral with the front axle which is also center dropped.

Front View of Standard Truck

A noteworthy feature is the sturdy construction of the steering mechanism; such as steering knuckles, tie rod, etc. The starting crank is so attached as to permit it being swung crosswise, out of the way, when not in use.



The Continental Motor

The Continental Motor is here shown installed in a Standard Truck, with the working side exposed. The pipe just below the intake manifold is part of the governor mechanism, operating a shutter in the intake pipe.

Steel Frame

The steel frame used is of great strength and is neat and trim in appearance. All rivets are placed in the sides and in the bottom flanges, the top flange being left clean, which facilitates change of bodies. The side rails, 6 in. channel, 2⅛ in. flanges are straight throughout, stock 7-16 in. thick. There are but three cross members, though the front bumper plate, when bolted to place, serves as a reinforcement. The idea in the construction is flexibility; it is desired that the frame shall have ample opportunity to weave consistently with the constant changing road conditions. Gussets, as used in the Standard three-ton truck, are applied only to the bottom flanges.

Wheels and Tires

Wheels, artillery type, are designed for great strength and to meet all conditions of heavy service. The rear wheels have fourteen spokes 3½ in., 6½ in. long from hub flange to felloe. The front wheels have twelve spokes, 2½ in., and in both front and rear hubs have very deep spoke sprockets. Wheels are built S. A. E. standards and will accommodate any make of tires.

The front tires are 36 x 5 in. single, solid rubber, the rear 36 x 5 in. dual, solid rubber; the front tires, therefore, track with the inside rear tires. Demountable types are favored.

Springs and Brakes

Front and rear springs are semi-elliptic, front members having eleven plates of graduated thickness, length from center to center 45 in., width of plates 2½ in. The rear springs are 52 in. long, 3½ in. wide and are composed of fifteen plates of varying thickness. Front and rear support of the rear springs is had through two 1½ in. steel cross bars and heavy yoke shackles are also used. The cross bars are anchored in heavy brackets carried on the frame rails. Spring clips are 1¼ x ⅞ in., heat treated nickel steel, upset on the ends to take a 1 in. nut. Eyes are bushed.

Service brakes, 12 x 2 in. are the contracting, Raybestos faced bands on the jack shaft. Support of the brakes is in brackets attached to the jack shaft housing. They are easily accessible for adjustment. The pull rods are steel, S. A. E. standard yokes, main body of the rods ⅜ in. in diameter.

The emergency brakes are the internal, expanding Raybestos faced shoes in the rear wheel drums, these 18 x 4 in.

Weight, Capacity and Loading Space

Normal load capacity of the Standard three-ton truck is 6000 lbs. and the weight of the 12 ft. chassis is approximately 6100 lbs. On the short chassis the frame length back of the driver's seat is 8½ ft. minimum; 10¼ ft. standard and 11¾ ft. maximum. In the 12 ft. chassis lengths in the same order are 10¼, 12¼, and 14¼ ft.

Minimum chassis length in the short wheel base car is 15 ft. 7 in., standard 17 ft. 4 in., maximum 18 ft. 10 in. The standard model in like order is 17 ft. 4 in., 19 ft. 4 in., and 21 ft. 4 in.

Bodies

The Standard three-ton car is featured in chassis only, and this in lead, coloring and lettering extra. Bodies will be furnished on order. Seat frame is steel and the running boards, supported on pressed steel hangers, are also steel with a raised surface or safety tread. Fenders are steel and rigidly supported. The dash is metal covered front and back.

Four Lengths of Chassis

The Standard three-ton truck is in four lengths of wheel base, called short, standard, long and extra long. In the order given these are 10 ft., 12 ft., 14 ft. and 16 ft. Height without load considering the chassis over all is 6 ft. 2 in., frame height at the rear being 3 ft. Width of chassis over all is 7 ft. 1 in., frame 3 ft. 3 in. Price of the Standard chassis is $2750, f. o. b. Detroit, Mich. Other lengths are $50 additional.

Equipment includes seat, side and rear oil lights, horn, complete set of tools, jack, etc.

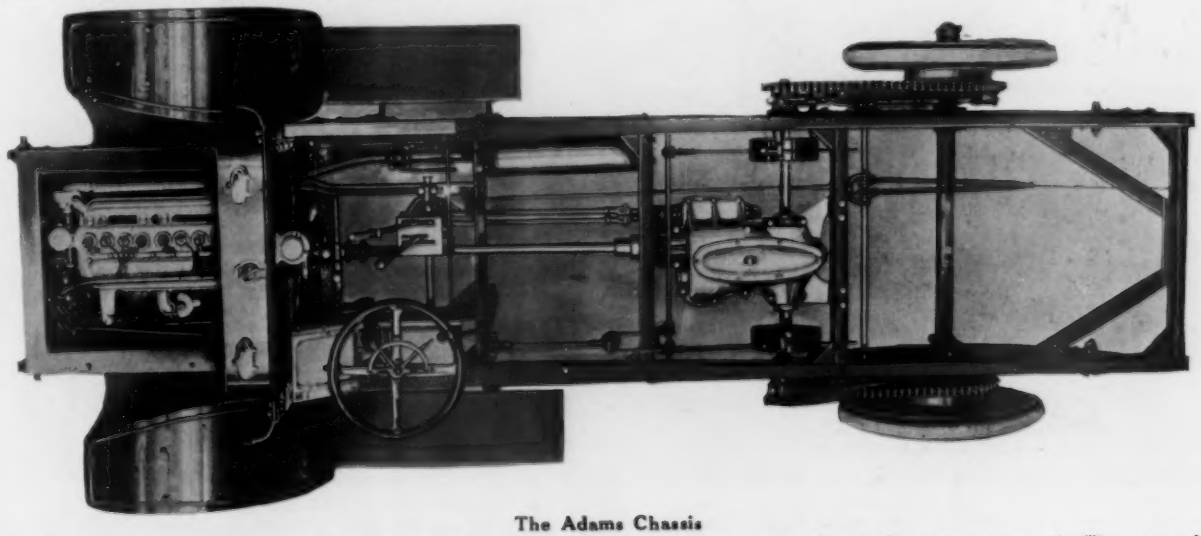
Adams Trucks in Three Models

The Adams line for the coming season will comprise three models, to be known as models "A," "D" and "E," and rated at 1, 1½ and 2 tons respectively. The essential principles underlying the design and construction of these trucks present a similarity which only differs in the larger models as regards such members, which must be of a size to support the additional capacities. A general description will therefore suffice, pointing out the larger dimensions in the heavier trucks. These trucks are the manufacture of the Adams Brothers Company, Findlay, O.

The Motor

The four cylinder, 3⅞ x 5 in. motor is cast en bloc with ample water circulation between each cylinder, and is rated at 30 h. p. Pistons are of a special grade of cast iron and ground, and are fitted with piston rings of the same material and ground on all working sides. The crank shaft is 3½ per cent. drop forged nickel steel of liberal diameter and unusual length of bearing journals, having three crank shaft bearings. Bearings are of special composition, insuring excellent service. Cam shafts are drop forged integrally with cams, and entirely enclosed in upper half of crank case, actuated by means of spiral gears.

The valves are mechanically operated and interchangeable, of a very liberal diameter, located on the right side of motor. The crank case is made of aluminum alloy, and is so designed that the upper half contains all the components comprising the motor, while the lower half constitutes the oil reservoir supplying the lubricant for the motor. Lubrication is so laid out as to offer the advantages of splash and force-feed systems combined.



The Adams Chassis

An idea can here be had of how the various parts of the chassis are located, in relation to one another, and how they are mounted. The motor and control levers are mounted on a subframe, while the transmission is hung from cross members. The radiator is located at dash, just forward of same. The control levers are located at the center, with the steering wheel on the left.

Cooling and Control

Positive water circulation is effected by a spiral gear-driven centrifugal pump, fan in fly wheel. The radiator, of a very efficient type, is situated back of the motor. It is of the vertical tube type provided with two filling caps, one on each side, and is carried on flexible supports protecting the radiator against damage emanating from the unequal motions to which the side rails of the frame are subjected. Ignition is by high tension magneto, dual system.

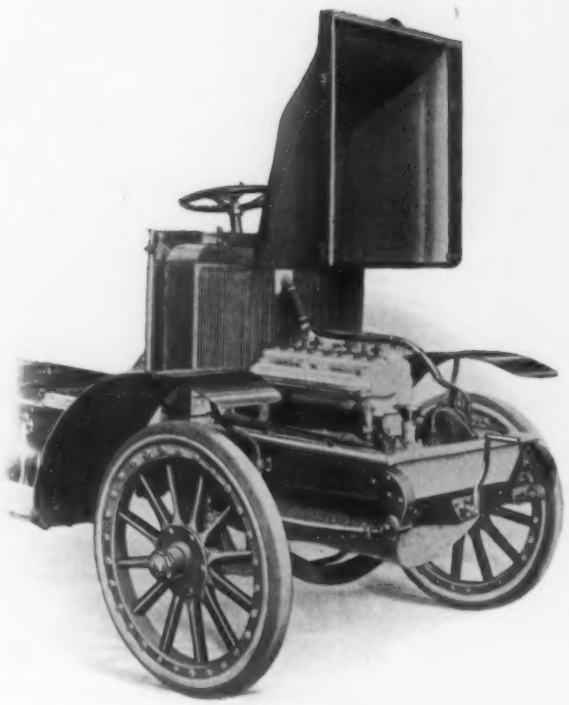
Steering is accomplished by the irreversible, screw and nut Ditwiler type, located on left side of car, which permits the driver a clear view of the road and on-coming vehicles, as well as to gain his seat easily and directly from the sidewalk, without any loss of time. Spark and throttle control is mounted on steering wheel, and with the location of the magneto and carburetor the connections between the same and the steering post are established directly by two straight rods. The carburetor is also controlled by foot pedal, and is of Schebler make.

This arrangement and the location of magneto, water pump, filling funnel and oil gage on front end of motor affords easy access to any part of motor by simply lifting the hood. This can be removed without disturbing any other adjoining parts.

Clutch, Transmission and Brakes

The multiple disc clutch can be dropped in suddenly when engaging low, intermediate or high speed and the car, it is said, will pick up smoothly without undue strain on transmission, axle or other driving parts.

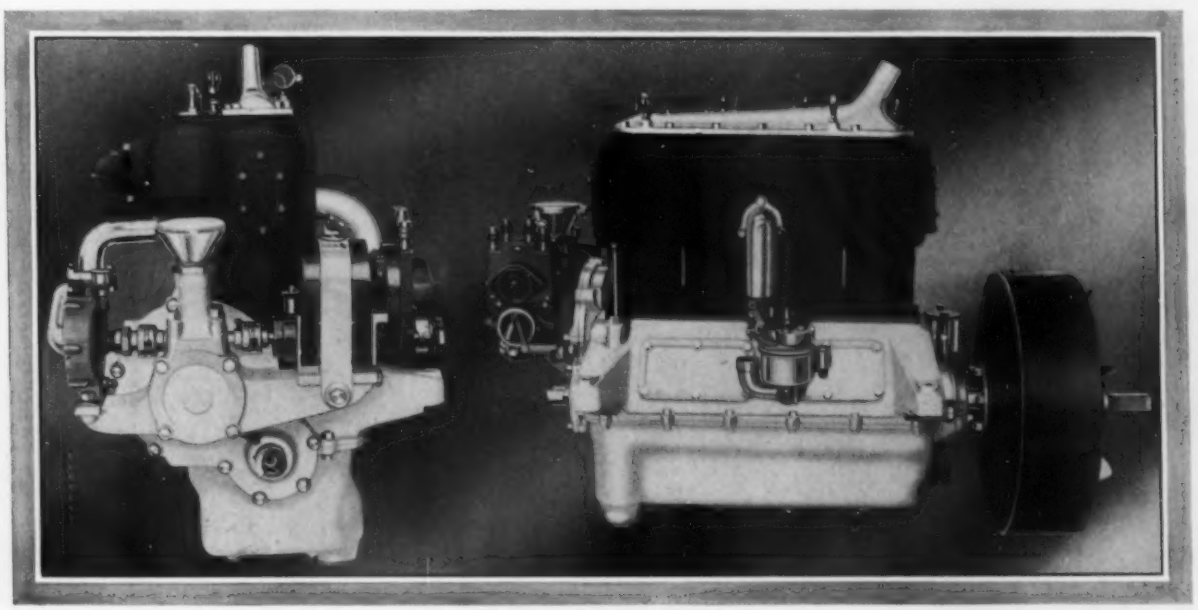
The transmission is of the selective type, three speeds forward, one reverse; direct drive on high speed, located in center of car and connected with the clutch by driving shaft and universal joints which take up variation in alignment. All working shafts are of special alloy steel.



The Adams Motor Exposed

This illustration shows the accessibility of the Adams Motor, by merely raising the hood. The magneto, water pump and breather pipe are all located in front, convenient for inspection or adjustment. An idea of the location of the radiator, in relation to the motor, can here be had.

The service brakes on jack shaft are operated by pedal and the emergency brakes on rear wheels by hand lever. Hand levers are located in center of car, to right of driver.



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The end and side views of the motor, show how the various component parts are located and mounted. The water pump and magneto are placed transversely in front of the motor and are driven by a transverse shaft driven from the timing gears. The side view shows the carburetor and the method of attaching same to cylinders. Two hand holes give access to the connecting-rod bearings, by removing the cover plates. In the flywheel is incorporated a fan to carry off the hot air.

Frames, Axles and Springs

Drive is through double side chain, 1¼ in. pitch x ¾ in. roller. The frame is of special high grade pressed steel, 38¾ in. wide, offset between front wheels and of generous U-section. Axles are of Sheldon make. Front springs are semi-elliptic, 2¼ x 44 in. long. Rear springs semi-elliptic, 2½ x 44 in. long.

Wheels, Tires, Etc.

Wheels are 36 in. artillery type. Dual in rear. Tires are solid, 36 x 3½ in. front, 36 x 4 in. rear.

The wheel base is 121 in. or 136 in., having a tread of 56 in. or 60 in. Carrying capacity is 1 ton.

Standard body length (121 in. wheelbase) is 8 ft. 9½ in. x 3 ft. 9½ in. wide. Maximum length of body back of seat (136 in. wheelbase) is 11 ft.

Equipment consists of two oil side lamps and tail lamp, set of tools, jack and horn. Gasoline tank capacity is 15 gallons. The chassis price is $2100.

The 1½-ton truck differs from the 1-ton truck in that the front springs are semi-elliptic, 2½ x 44 in. Tires in front are the same, but 36 x 3 in. dual are used at the rear. This chassis is listed at $2300.

Model "E" is a 2-ton truck and is listed at $2500. A 30 h. p. motor is installed and the wheelbase is 140 in. A rear spring of 50 in. is employed. The tire equipment is 36 x 4 in. solid tires front and 36 x 3½ in. dual rear.

NYBERG COMMERCIAL CAR CHANGES FOR 1913

The 3000-lb. commercial car manufactured by the Nyberg Automobile Works, of Anderson, Ind., will undergo a complete transformation in preparation for the 1913 season.

Among the many important changes to be made over last year's model are the shifting of the steering gear from the right to the left side and the placing of the control in the center. The general design of the truck has been completely changed, engine being mounted in front of the frame under a separate hood and not under the driver's seat, as the 1912 model. The driver will occupy a seat immediately behind the hood.

The 1913 model will have a capacity of 3000 lbs. and will weigh about 1450 lbs.; 36 in. wheels are to be used, single tires in the front and double in the rear. The truck will have a 58 in. tread and a 135 in. wheel base. The radiator will be spring suspended.

The new model will be powered by a four-cylinder block motor, developing 37 h. p., and having cylinder dimensions of 3¾ in. bore and 5½ in. stroke.

LUBRICATION IN WINTER

Speaking generally, lighter and thinner oils and greases should be used on the car in winter than in summer because the lower temperature makes the heavier lubricants too thick.

Oils for the Motor

Trade Marked Oils are usually made in several grades, each having a different body. When an oil is found which is satisfactory in summer, get a slightly lighter grade of the same oil for use in winter. The winter motor oil should not be much different from that used in summer, because the engine gets nearly as hot in winter as summer. The only time the heavy oil will be troublesome is when the motor is cold at starting.

Other Lubricants

The transmission, differential, wheel bearings and other parts, on the other hand, will be much colder and require lighter lubricants. The same is true to a greater extent of spring shackles and steering parts.

The Kelly Ice Truck

This ice truck, built by the Kelly Motor Truck Company, Springfield, Ohio, is of three tons capacity, and is in the service of the Tennessee Ice Company. The truck is being used in house-to-house delivery, having one white man and three colored men to do the work. One day it made 336 stops, the work done formerly by three double teams and six colored men, with one white man. On this day it was on the go from 3 a. m. to 6 p. m., excepting thirty minutes for lunch, and showed high efficiency.

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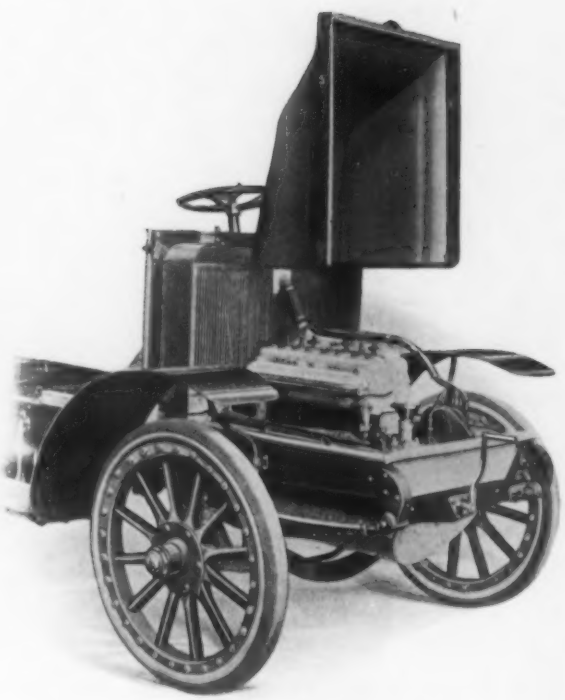

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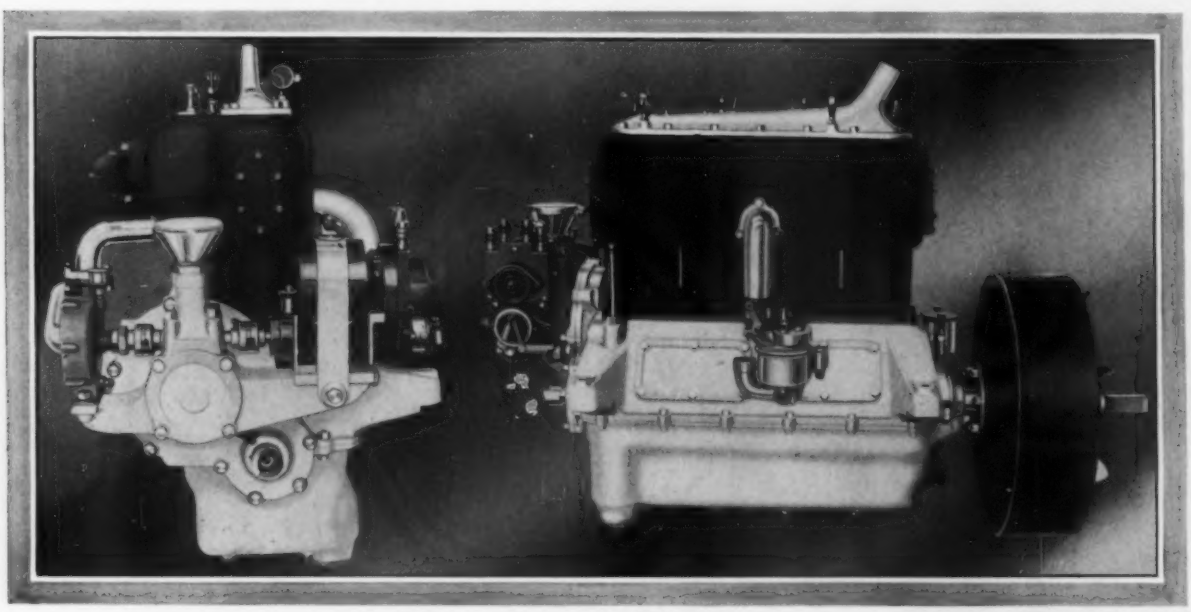

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FIVE-TON TRUCK TRIPLES BUSINESS OF HARTFORD, CONN., SODA WATER BOTTLERS

Competes With Express and Freight and Effects Good Saving

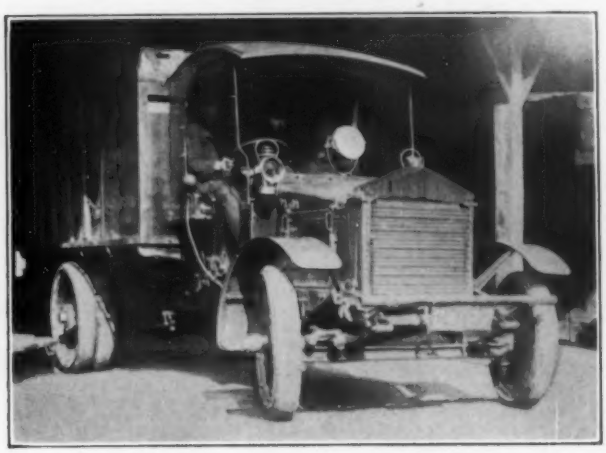
Six months ago, C. J. Ayers & Son, soda water bottlers at Hartford, Conn., were regarded as more or less of a local proposition and not likely to make an impression in the territory of contemporary bottlers in surrounding cities. It is a safe statement that up to this time the members of the firm regarded their business as purely local. But the firm of Ayers had ambition, and any firm with ambition having to do with deliveries is bound, sooner or later, to make use of motor trucks. In the course of events, Bob Miner, the Hartford sales agent of the Pierce-Arrow worm-drive trucks, discovered the firm of Ayers in a very serious frame of mind. Result, Bob sold a five-ton Pierce, and, as Elbert Hubbard would express it, did them a "lasting benefit."

Expansion

That the purchase of the truck was good business is evident from statements made to the COMMERCIAL CAR JOURNAL representative, in the course of an interview. Business has expanded and, with the aid of the truck C. J. Ayers & Son get into the "enemies' country," for it must be borne in mind that every city has its own soda water bottling establishment. One may well imagine the chagrin of bottlers in other cities when the Ayers truck with a full load came through the streets. That's expansion.

Put Us on Earth

The COMMERCIAL CAR JOURNAL man asked C. J. Ayers, executive head of the firm, what he thought of his equipment. Ayers, senior, smiled and the reply, characteristic of the man, tells the story. "Between you and me, it has 'put us on earth.' We do more business than any other soda water bottler in the State of Connecticut and almost as much as anyone in New England." "Did you have an extensive outside trade before you installed the car?" asked the C. C. J. representative. "No; our business was within a radius of 20 miles."



The Ayers Truck Starting on Its Daily Round

More Than Satisfied

"Are you satisfied with the work that the car is doing?" was asked. "We are pleased in every way with the truck, we are more than satisfied." "Do you contemplate installation of other cars?" "Yes, we will put on another in the spring." "I assumed," said the C. C. J. man, "when I saw the car coming down the street that you must be doing a good business to make use of a high-priced truck." Ayers, senior, smiled, for the mention seemed to please him.

What It Is Doing

In reply to the C. C. J. man, C. J. Ayers stated that the car makes trips to New Haven, Meriden, Wallingford, Bristol, Terryville, Rockville and numerous other towns in the State of Connecticut. But this is not all, for northward lies the hustling little community of Springfield, Mass. The Ayers truck makes frequent trips to this city with a full load and on the occasion of the C. C. J. man's visit it was being loaded for Holyoke, Mass. Chicopee, Chicopee Falls, Ludlow and other Massachusetts towns are now included in the Ayers' itinerary. Mr. Ayers stated that the work of the car has been closely observed by other interested truck users.

Tripled Business

The business now being done by the firm is about three times what is was before the truck was installed. That is a tremendous gain to make in a few months and is a worthy example of what motor delivery will do for a wide-awake firm.

Twelve Thousand Miles in Six Months

C. J. Ayers states that the car has been driven 12,000 miles since its installation six months ago, an average of 2000 miles a month and, allowing 26 working days to the month, the daily average is 77 miles. The executive head of the firm says 100 miles a day is a fair average for the car. One hundred miles is traveled in making the long trips, for example, to New Haven and return with deliveries about the town.

Competing With the Common Carriers

The Ayers five-ton Pierce truck competes with the common carriers, the trolley express, the express companies proper and the freight systems. This is something of a combination to buck, for as has been proved time and again, the big carriers will, if necessary, make desirable concessions to keep the business. "Do you find that it is cheaper to make the long distance hauls to other cities in the State than to ship by freight or express?" asked the C. C. J. man.

Again Ayers, senior, smiled. "All our goods are shipped in cases, average weight 57 lbs., though the road accepts them at 50 lbs. By express the cost of shipment is 20 cents a case and by freight, 6½ cents. If we ship by freight we must haul the cases to the terminal at point of shipment and collect them at destination and then deliver. It costs 5 cents a case to deliver by freight at one end. Then there is a cartage charge of 2 cents a case and when you want the empties back why that costs you just 4 cents more. On the other hand, with the truck we load the night before and the boys make an early start, leaving about 7 in the morning. In three hours' time they are in New Haven making deliveries. In the afternoon they are through and start back home, reaching here about 7 in the evening."

Like Brewery Service

"Another feature about the truck work is that like the brewery cars we pick up our empties as we go along, so that the truck is loaded both ways. The empties come back to us direct."

What Purchase Meant

"We bought what we considered the best," said C. J. Ayers. "It meant a lot to us, for the car cost just about $5000. If it went wrong there was just that amount tied up. We figure that it had well earned its up-keep this season. But it has never gone wrong and is doing business every day. Our trade? Well, it is mostly summer. It might be regarded as dead at this time; this is winter with us. Will we operate in the winter? Yes, we will make at least one trip a week to the outside cities we go to now."

Delivery No Problem

"Delivery is no longer a problem, we never bother about it. We just go out and get the business; that is all settled now. Depreciation? No, we charged off nothing for the year. The makers estimate 3 2-10 cents per mile and we will probably work on that basis. How about city delivery? We use the truck for that, too."

Exercising the Horses

"I have two horses in the barn, they have not been out in a week and they are simply eating their heads off. Friday I shall lay aside the car and work out the horses, though I do not need them."

"What do you plan to do tomorrow?" asked the C. C. J. man.

"Come over here," said Mr. Ayers. "This pile of cases, there are 172 of them, are to be delivered to New Haven."

One Hundred and Four Stops

"To deliver the load we will make 104 stops, as many as 50 cases a stop, and by the time the work is done and the car back home, it will have covered 100 miles. At each of these stops in New Haven we will collect empties. What do I contemplate for improvement? In the spring I will have a gravity loading device which will save a handling or two and cut down the loading time."

Twenty-Mile Limit Before Using Truck

"Before we had the truck we kept within 20 miles of home. We surprised the freight people one day this spring. We had 100 bags of sugar at the dock, approximately 5 tons. We got it all on one load, made the round trip from here in 40 minutes; it is about four or five miles. The freight people would not believe that we could do it until they saw us do it for the first time."

Twenty-Four Dollars a Day

Allowing liberal margins for all expenses, the Ayers truck, according to figures given, costs about $24 a day for 100 miles of work. The following is explanatory.

Load of 172 cases to New Haven.

Trolley Freight

172 cases at 6½ cents	$11.18
172 cases delivery, at 5 cents	8.60
172 cases empty	5.16
	$24.94
Return of empties	8.60
Total	$33.54

Rates of express proper are double those of trolley freight freight.

Truck Cost

Driver	$3.00
3 helpers	4.50
Tires	6.00
Insurance	1.00
Interest	1.00
Fuel	5.00
Oil	1.00
Depreciation	3.20
Total	$24.70

Saving effected by truck in 100 miles with a load of five tons, $8.84, or 26 per cent.

Depreciation is charged at 3 2-10 cents per mile, tires at 6 cents per mile, being guaranteed for 10,000 miles, the fronts having already given 12,000 miles of service; gasoline is charged at 12 cents per gal.; three helpers are always on the car and care for the load. Purposely figures are high, to cover contingencies unavoidably arising, such as hire of extra trucks on heavy days, these charged at $15 a day. Insurance costs $200 per year, or about 63 2-3 cents per day, while in the estimate the charge is an even dollar a day. Day's work of 100 miles is made at a speed 8 1-3 m. p. h., fastest time 14 m. p. h. Average on long haul is 4 miles to gallon of fuel and figures given for reason mentioned above, are $2 in excess of the rate. Deducting excess cost is $4 a day less for 100 mile haul, showing saving of 38 per cent.

No Repairs

C. J. Ayers stated that up to date the truck has not been laid up for repairs. Tires have given some trouble and some time has been thus lost. He figures that the truck should last seven years, but at the charge made for depreciation the car would be off the books in about five years, if operated 100 miles a day. It is stated that oiling instructions have been closely observed and that the driver takes pride in his work. That the car has for the past six months been used on these long hauls and needed no repairs is worthy of note.

Grafters all over the country are being shown up by great detective work. We don't employ detectives, but we want you to stop grafting on the other fellow and subscribe to the COMMERCIAL CAR JOURNAL for yourself.

HOW MAX BLATZ CELEBRATED THE FOURTH

It may be rather late to tell about the celebration of the Fourth, but inasmuch as the occasion with which we have to do is interesting, the lapse in time will be overlooked. Max Blatz lives eight miles outside Fort Wayne and runs a farm. He celebrated the last Independence Day by spending his money for a Service motor truck and has been pleased as

Max Blatz at the Wheel of His Commercial Car, Purchased on Independence Day

a boy over a new jack knife ever since. Three times a week he hauls materials to the Fort Wayne public or city market, finds time to drive his folks about the country and incidentally collects about $13 on Sundays from joy riders who travel out to a lake some distance from Fort Wayne. Max, like all Hoosiers, has a way with him and was insulted when he was asked if he liked the truck better than the horse. "I should say so, no more horses in my business," said Max, as he climbed up in his seat to have his picture taken. Incidentally, too, Max has discovered that a commercial car does not have a lot of the troubles to which horses are subject.

Schacht Truck in Service of Fruit Concern

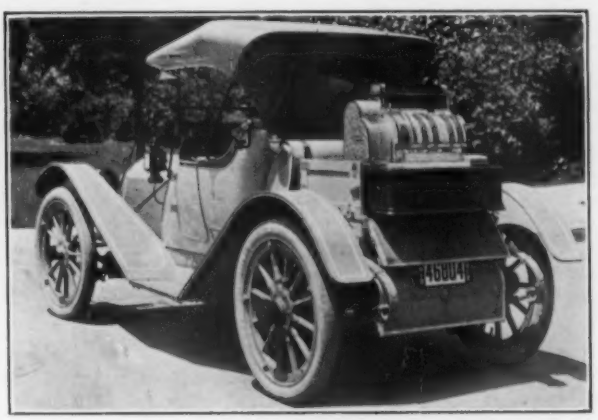
The daily mileage is about forty-five. Between five and six miles are made on one gallon of gasoline. Statistics from a five day's haul show the following: Total cost gasoline, $3.30; Total cost oil, 80 cents; Wages of driver, five days, $12.50; Truck was in service during those five days, seventy hours; Total tonnage hauled was 140; Total mileage, 219; Averaging per day about 43 miles. By reducing these figures to so much per day you arrive at the following: Wages of driver per day, $2.50; Cost of new tires would figure per day, $1.17; Twelve per cent annual depreciation would figure $1.24; Repairs would figure per day, 50 cents; Gasoline cost average per day, 60 cents; Cost of lubricants per day, 20 cents; Showing total daily cost, $6.21. A truck doing the work as above stated would replace two, 2-horse teams and one, 1-horse team.

The Adams Truck

This illustration shows the one-ton Adams truck in the service of the Pittsburg Produce and Fruit Company, Pittsburg, Kan. It is equipped with a special body with side and rear gates. The French type hood is here employed, with radiator located at dash. Note the roomy driver's seat, also the method of mounting body on springs. This truck with its body is manufactured by the Adams Brothers' Company, Findlay, O.

FIGURES AND FIGURES

One of the first things the initial user of a car ascertains is, that there is a difference in the cost of operation as he finds it and what he was told it would be, not that the figures lie or were given in any but the proper spirit, but simply that conditions alter the situation. It has frequently come to the attention of the COMMERCIAL CAR JOURNAL representative, that cost of operation had been accepted substantially as given by the sales agent. If the cost of car for a day's work were asked, the reply would be $7, $8 or $12, as the case might be. And yet when these same users were asked charges of various items totaled, they would be in excess of estimates, simply because of individual conditions not taken into account by the agent. Many users are negligent in the matter of cost records and continue to do things hit or miss. One user of a five-ton truck gave costs totalling in excess of $24 a day and stated that he put all items high to cover contingencies. He had experienced some difficulties with tires and while the tire people were always willing to treat him very fairly, the truck, nevertheless, was tied up for a time and on long hauls that meant a stay over night for the crew. The agent had never considered any such condition.



Roadster Carries Cash Register

This illustration shows a Republic roadster built by the Republic Motor Car Company, for the service of National Cash Register Salesmen. The register is carried in a special trunk which is bolted down to the rear deck. Underneath this trunk is a drawer, four inches deep, extending the width of the car, in which the salesman carries various advertising matter. Underneath the front seat is a drawer which carries the register tools.

Lack of Inspection in the Selling Branch Responsible for Dissatisfied Customers

How the Inspection Department Assists in Future Business and Retains Present Customers

BY E. S. FOLJAMBE

FOR several years Reed had been conducting what might be termed a successful branch. He handled for a well known manufacturer, a line of commercial vehicles, which included not only large capacity units but also several intermediate and small sized trucks, so that he was in a position to cater to the needs of almost any business house. Although considered successful, as success is counted among truck dealers, he had not attained that marked degree of success which he desired and which he believed the merits of his truck warranted.

We find him thinking deeply over the subject and wondering wherein he can improve his business. The phone rings—it proves to be Mr. Caldwell, who recently purchased a fleet of five machines —"I say Reed, can't you send Jimmy around; there seems to be something the matter with the new body on my three-ton truck; it won't connect as it should with the seat and forward parts, and I thought perhaps Jimmy could fix it up." "Sorry," says Reed, "but Jimmy is over to Burk's fixing up a little trouble over there which does not amount to much, but I'm afraid he'll not be able to get over to your place before tomorrow." "Well, send someone else over then," said Caldwell, tartly, "I cannot do without the truck, and it's holding up my deliveries. It certainly is aggravating to have a new machine and find you can't use it because so many little things are wrong and details have been overlooked. You know this is the third time I've had to call on you this week." "I'll send Charlie right over, Mr. Caldwell," said Reed. "I'm very sorry that these little difficulties have come up, and if he can't fix it, let me know and I'll have Jimmy over the very first thing in the morning."

"I cannot do without the truck, and it's holding up my deliveries"

A Mistake

During this conversation over the phone, Dickinson, the head salesman, had stepped into the office, and when Reed turned to him he appeared to be in deep thought. "I believe we're making a mistake," said Dickinson, "I just heard part of the conversation over the phone and knew that you were speaking to Caldwell. Just the same thing that is making him sore knocked me out of a sale not over an hour ago. I was in to see Charlie Clark, of Clark & Aldredge, and today I thought I had his signature on the dotted line, but he seems to have been talking to somebody, and just when I thought we were going to make a goal, he slipped and we didn't make the touchdown. After talking with him for quite a while I found that he had been talking with Burk. That settled it. Burk's sore because the lettering on his five-tonner wasn't just as he ordered it, and then I believe there was something wrong with the dimensions, and he had trouble in getting up to his platform and had to have the doors changed. Of course, I don't blame him. It was aggravating, but you see it's lost me a sale to Clark. Now here's Caldwell having trouble with little things on his trucks, because they're not exactly as he ordered them. They may not amount to much separately, but they certainly do collectively. Two of his five machines have actually been out of service three days this week because of little details which should have been cared for at our factory. It's a shame they can't send things through the way they're ordered; they're always making little mistakes that give us trouble, and we've got to check them in some way."

What's the Matter?

"I believe you're right, Dickinson. I've just been pondering over the situation and wondering what's the matter that we're not getting more re-orders and doing more business, for as you know, our trucks certainly deliver the goods. I think you've struck the nail on the head; it's this everlasting trouble with little things which causes dissatisfaction among our customers, and occasionally somebody more inclined to abuse than the others gives us and our truck a black eye. What we need is a good capable man to inspect every truck before it is handed over to the customer. We cannot prevent the factory from making mistakes; only the other day on that rush order for Kendall, when they were telephoning and keeping the line busy because they were so anxious to put the truck on a special job we were held up over a day because the filler cap on the gasoline tank was not made the way they'd ordered it on account of the peculiar way old man Kendall had arranged for filling. We just happened to notice it, and after he'd made such a fuss about having it a certain way, I hated to deliver the machine without having it right. What we've got to do is to see that things are right, down to the minutest detail, before the trucks are delivered to the purchaser. Kendall was so pleased with the filler arrangement that he was like a child with a new toy, and had to demonstrate it to some friends who

happened to be in the office at the time. If that truck had gone over there the way it came to us from the factory, I'd be willing to bet he'd been madder than a wet cat.

"Caldwell is getting disgusted now, just on account of such little inaccuracies. That new body that we had made, it seems, didn't fit the seat and forward parts and it may take a day to fix it. Yes, sir! Inspection before the truck goes out of this establishment is what is needed, and not only that, but there ought to be somebody to see that the truck is properly put in service and cared for the first few days, or at least until the owner gets his hand in."

Inspection Department Established

After that conversation an Inspection Department was established. Jimmy was put in charge, and with a couple of assistants, carefully went over every item on the order and checked up each measurement where special bodies, tail gates, tilting seats or tops, were ordered. He was given to understand that if any customer came back because the truck or its accessories were not as he had ordered, it would be up to him.

I'll say for Jimmy, he's done his work well, and although it's only been a year since we established the Inspection Department, the results have shown the wisdom of such a move and the additional expense has more than been compensated for by satisfaction of customers and increased sales.

"Already we are getting a reputation for accuracy, and it's said, 'When you order from Reed you'll get exactly what you ask for, right down to the design of the buttons on the upholstery. It's the little things that count." Business has gradually increased and although we have occasional calls to assist a purchaser with his new machine, it is very unusual for any of our customers to be held up for three or four days on account of . . ." just then the phone rang, interrupting the conversation. "Hello, Willis," said Reed, "what's on your mind?" "Nothing, old man, just called you up to tell you that a great burden has been lifted from my mind. We asked for a number of little things out of the ordinary on those

"What we need is an Inspection Department, with a capable man in charge to inspect every truck before it is handed over to the customer."

machines you just delivered, and as I didn't put the order in any too soon, I wanted them for use the minute I could get them and I was afraid that you'd go wrong on some of those special arrangements, such as the double hinged back on that panel job, but I want to congratulate you, Reed, for everything was exactly right and we put the machines to work without a minute's delay. Drop over and have lunch with me at about one tomorrow. On my recommendation the board has decided that we had better arrange to extend our delivery, and I think on the strength of what you've done for us you can do some business." "Thank you!" says Reed, "the pleasure's all mine. I will be with you on the minute."

"There," said Reed, "that's an example of what has happened more than once during this year since we inaugurated the Inspection Department. As I was saying when interrupted, none of our customers are ever held up on account of our failure to supply absolutely what has been specified."

FIGURES 270 DAYS A YEAR

A user of horses and commercial cars stated to the COMMERCIAL CAR JOURNAL representative that in his estimates of costs of service and the like, he should consider 270 working days as the proper mark rather than 312 or even 300 days. "My experience has been," he states, "that a truck, whatsoever size it may be, will not operate much over 270 days a year, whereas a horse will do service 300 days a year. Trucks in our service (coal and building material delivery) will depreciate 25 per cent. a year and the horses 15 per cent. When I say 25 per cent. a year I mean 25 per cent. of the original cost per year."

"Granting that your horses depreciate 15 per cent. a year, and work 300 days a year, and are salable for other work when unfit for your service, do you feel that you could go back to horses exclusively?" he was asked.

"No, we can never do without the cars; they are modern business fixtures and our trade demands them."

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Furniture Body on Three-Ton Packard Chassis

The illustration shows a three-ton Packard chassis with a furniture body, which is the manufacture of the Motor Truck Body Company, Detroit, Mich. The driver's seat, which is especially spacious and easy of access, can be completely enclosed with windshield and curtains, and in similar manner the body can be covered by a tarpaulin top, in case of rainy weather. The company states that it has had a great demand from several dealers regarding this body since delivering it.

The Municipal Automobile in Europe

Some Notes Concerning Its Use in a Few Representative Cities

BY OUR FOREIGN CORRESPONDENT

THAT the influence of motor traffic is being felt in Europe in street cleansing, which is perhaps the chief duties of municipal authorities, may be gathered from the fact that in 1910, 26,800 fewer tons of "slop" were cleared from the London streets than in 1905. Nor is this all, for with the disappearance of this "slop" the roads in wet weather are becoming less slippery, and the cost of the ballast or grit thrown on to the greasy roads has fallen from $10,000 to $2500 in the same period.

In few branches of modern social development has the automobile had greater influence in Europe than in municipal work, and although to some extent in Great Britain the steamer has been adopted, the gasoline truck is making rapid progress. In many directions, in fact, to some extent it is tending to displace the steamer, which latter, though it was certainly superior for heavy work for loads above 3 tons, is now, even in the heavier sizes, being caught up by the more modern development.

Practical Advice From Practical Experience in London

Those who use the shoe know best where it pinches, and on these lines a few opinions of a municipal engineer on the drawbacks and advantages of motor traction for his work are worth pages of theory. Therefore, let me quote from the experience of T. W. Higgins, the Borough surveyor of Chelsea, one of the big boroughs in the London district. Mr. Higgins insists that if motor vehicles are to be used economically they should, as far as possible, be operated on double

A Fram Electric Front-Driven Garbage Wagon Used by the Paris Municipality

An Example of the Lighter Type of Street Sweeper Used in Paris

shifts. It is true that most of the vehicles under Mr. Higgins were steamers, but the same applies only in a slightly less degree to the gasoline truck.

There are obvious advantages, too, in the use of the rotary broom, not as a separate motor vehicle, but as a trailer to the water truck. In the Chelsea organization the following arrangements enable the motors to remain for work many hours at a stretch. At midnight the water automobiles leave the depot and flood the main roads, followed an hour afterwards by the rotary brooms, that sweep the slush to the sides of the streets, and meanwhile, the water trucks, having finished flooding the main roads, they turn back flooding the road a second time, and keep it soaked until the sweepers follow with hand squeegees. By this time the water trucks can commence their ordinary day's street watering, at which, with a change of driver in the middle of the forenoon, they continue until the afternoon. The automobiles with rotary brooms either leave the broom trailer at the depot and assist in the work, or can

continue sweeping throughout the day. By working double shift and keeping the cars continually in action, the capital they represent is being worked to the best possible advantage.

In most cases the municipal engineer, as Mr. Higgins points out, has to take things as they are and adapt existing sites to motor garage requirements, but if he gets the chance he always secures a site in a fairly central position, with separate entrance and exit gates, if possible, and sufficient yard space to maneuver the vehicles, so that any one car can enter or leave without interfering with others. Proper arrangements, too, should be provided for every motor for removing, replacing or interchanging bodies, and, if possible, it is well to arrange for the second body when out of use to be hung at the end of what may be called the car's stall.

To keep the various road making gangs, masons and paviors, etc., at work, small quantities of materials often have to be sent to a number of places first thing in the morning,

A Laffly Water-Wagon With Side Sprinkler

and it is found that a well loaded motor can serve five or six gangs and be back at the depot before a horsed-truck can serve two of the gangs.

As a good deal of the work is done by night when the roads are clear, and traffic in the day time has to make way for the street service cars, the municipal automobile has in this respect an easier life than many, and this all conduces to longer service. In fact, experience in Europe points to a comparatively long life for the municipal motor truck.

Clearing Street Gullies

On the Continent the motor has proved particularly serviceable for clearing street gullies and so forth, each car being provided with a large tank that can be exhausted to partial vacuum by the engine when desired. Although this particular method is in the main best suited to Continental, as distinct from British requirements, it is by no means an unknown type in Great Britain, and as an example of what one of these machines can do, the experience of one employed by the authorities of Chelsea may be quoted. It was found in comparing this with the old method that, while four horses with their attendant, vans, drivers and gullymen could clear 1898 gullies at a cost of $360, the motor dealt with 1748 gullies at a cost of only $220.

In deciding on the type of vehicle it must be realized that there is no single design best for all municipal purposes. The automobile can be put to too many uses to render this

Renault Street Sweeper and Water-Wagon in Paris

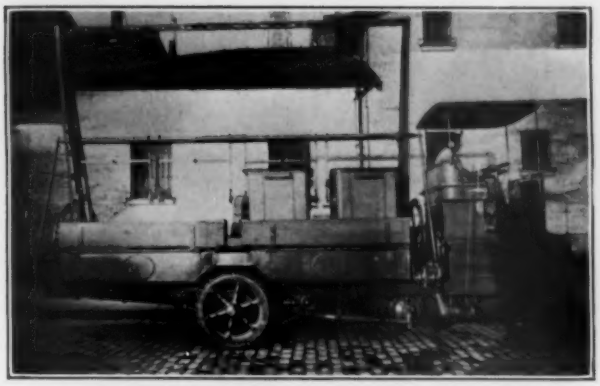
possible, but to give good all round results, a gear can be fitted with adjustable sides for municipal work, though it is advisable that whatever the type of the body, the under carriage should be so arranged that the cartage body can easily be removed and substituted by a galvanized water tank; and if general European practice is any criterion, a drawbar for the attachment of a trailer or rotary broom behind should be provided. A very usual form of cartage body is constructed of well seasoned ash framing with hard wood bottom. The end behind the driver is permanent and 3 ft. deep, while the tail board is hinged, the whole, being designed of sufficient capacity to carry 6 cu. yds., is lined with sheet steel, while easily removable covers are fitted over the top. Of course, some form of tipping gear is fitted, the telescopic or tooth quadrant type being the most usual.

About 800 to 1,000 gallons capacity is usual for the tank. In collecting house refuse from door to door, the comparatively large 3 ton types of motor do not always show such good results as in other departments, especially where refuse is shot to a destructor or wharf well within the borough. A big automobile like this represents a comparatively large capital cost, and if too much time is spent standing at the doors of individual houses, it is all against profitable working; and thus it happens that municipal motors often show better results in this department where the refuse has to be carted to a considerable distance. In such cases the automobile has shown big savings.

The Municipal Motor in Paris

In Paris the street cleaning department of the city have decided to abolish horse-drawn rotary sweepers entirely. The three types, that have been decided on as the result of a competition nearly a year ago, may roughly be divided into three classes.

A Latil Front-Driven Combined Sweeper and Waterer



The Sautter-Harlé House Garbage Collecting Car in Use in Rouen, With Bins That Can Be Dumped by Crane

The first is a light sweeper with a two or four cylinder engine, preferably equipped with a tank and a sprinkler ahead of the brush, in order to settle the dust. These have been supplied by Laffly, Renault, and Dury-Sohy, the two cylinder engines driving the front wheels on the Brasier system by chain. The next is an intermediate type, having a rotary sweeper and a large capacity tank for street watering. These water carts with side sprinklers are capable of watering the widest avenues at one operation, and are used chiefly in the fashionable wealthy districts.

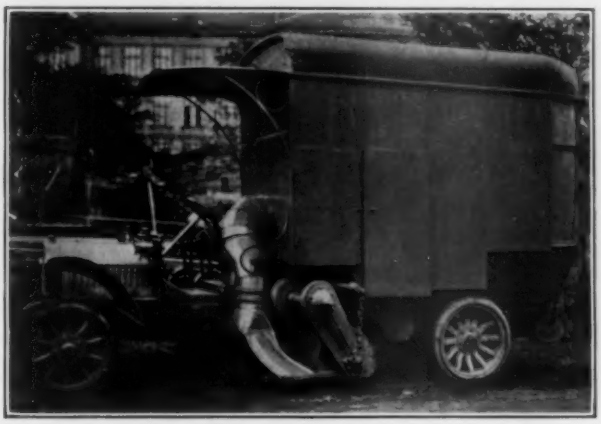
Then there are the garbage collecting wagons. Two types are in use, one the Fram electric, the other a petrol vehicle built by Pierron. Both are front driven and the frame is underslung with a very low clearance, the body being of sheet metal with sliding panels on the top. These machines are comparatively still in the experimental stage, house to house collection of garbage being carried out in most cases by men with horses and carts working for a contractor.

In Ruoen

In Ruoen they have a special type of motor driven garbage collecting vehicle. The chassis with the engine in front and the driver sitting over it carries a large shallow tank with a big overhang at the back. By the aid of a pump and side sprinklers this machine is used for street sprinkling and washing. Above the tank are mounted eight bins in a couple of rows, and these are handled by means of an engine-driven overhead crane, that can swing to either side. These bins are deposited empty at certain appointed places, taken round on barrows for house to house collection, and brought back to the appointed place to be picked up by the motor on its round. They are then carried to the shoot, discharged by the crane, picked up by an electric traveller and emptied into the destructor without any manual assistance whatever. These vehicles have been made by Sautter-Harle et Cie, of Paris.

In Vienna

Although in Vienna municipal enterprise has been developed to a greater extent than in any capital of Europe, strangely enough street cleaning work still remains the domain of horse traction, though several motors have been introduced for the purpose. But these at present are regarded more as trial vehicles than for standard use.



A Viennese Car With Sweeping and Dust-Sucking Apparatus

The most interesting is shown in the accompanying illustration. It is a 28-30 h. p. car combined with a cleansing and dust-sucking apparatus. The dust is first raised by means

A 24-30 h.p. Puch-Parsche Tank and Pump Wagon of Twelve Hundred Gallons Capacity, Used in Vienna

of a brush, then sucked up and carried to the interior of the wagon by the action of a vacuum fan driven by the engine. The dust receptacles are interchangeable, and within six working hours it is said that 70,000 square metres of ground can be effectively cleaned. On that basis 40 machines of this type would be capable of doing the whole street cleansing work at present performed by 132 horse-drawn vehicles.

Another type that is doing good service in street cleaning and watering is the Puch-Parsche tank and pump wagon. This is made in two sizes; the larger, 24-30 h. p. truck is capable of 8 m. p. h. with its 1200 gallon tank completely filled, and 18 m. p. h. with tank empty. Loaded it weighs 9 tons, 16 cwt. as against 6 tons, 7 cwt. of the smaller size, which has a tank of 780 gallons capacity. These cars can also trail one or two street cleansing carts, while, as the tanks are detachable, the vehicles can be used for loads up to 10 tons with trailer. As they are also fitted with pumps they are useful in cases of inundation for pumping water from cellars. Moreover, as the pumps are of considerable capacity and capable of throwing a jet as much as 165 ft. high, they are also available for fire brigade service.

MECHANICAL TENDENCIES AT OLYMPIA

Although the commercial car was debarred from the British Motor Show at Olympia there were nevertheless a few points worth the attention of those interested in this branch of automobilism.

To begin with the engine. Now that forced lubrication is almost universal, designers are coming to realize the speed at which the oil has to be circulated, and that at such speeds as large a filter area as possible is desirable. Consequently in some engines the entire lower part of the base chamber is converted into a filter bed, and although in certain designs the crank chamber is narrowed down where the filter occurs, in other cases the filter extends the full length and width of the base chamber. On certain cases these filters are made withdrawable, the best example of this being afforded on the Vauxhall car, in which the complete filter tray, of the full length and width of the crankcase, can be withdrawn for cleaning, leaving the oil lying undisturbed in the extreme bottom of the base chamber.

With the exception of the Lenz hydraulic transmission, which is claimed not to exhibit the common tendency of overheating under heavy loads, and the "demultiplicator" mechanism, in which gear arrangement at the back axle affords two choices of more or less fixed gear ratios at the axle, there is little new to chronicle. The idea of this demultiplicator is that for heavier road conditions of a semi-permanent character, as for example, winter working, the demultiplicator can be set on its lower gear, while when easier conditions occur it can be set on the higher ratio. In this back axle too the differential is set on the longitudinal bevel pinion shaft and draws through similar gear ratios level crown wheels of different sizes on each axle shaft. This has been done for many years on the German Daimlers, the object being to afford the doubtful advantage of splayed back wheels.

In the front axle too of the La Buire car, there is a device, which on account of its simplicity and apparent effectiveness calls for remark. This is in the front axle arrangement. The stub axle projects from a plate, which on its other side is secured to the swivel at a point some two inches below the stub axle centre, and from the wheel centre the disc is free to swing. The stub axle and its attachment to the steering swivel are in fact eccentric to each other, and on encountering an obstacle the axle and frame tend to swing forward, and to some extent upwards, in spite of any check the wheel may receive. No spring connection is necessary for control or to return to position, as the weight of the car does this. It is in fact a gravity worked absorber to reduce the horizontal component of road shock. That it is effective may be judged from the fact that it has proved extremely successful in both the French and Russian military trials.

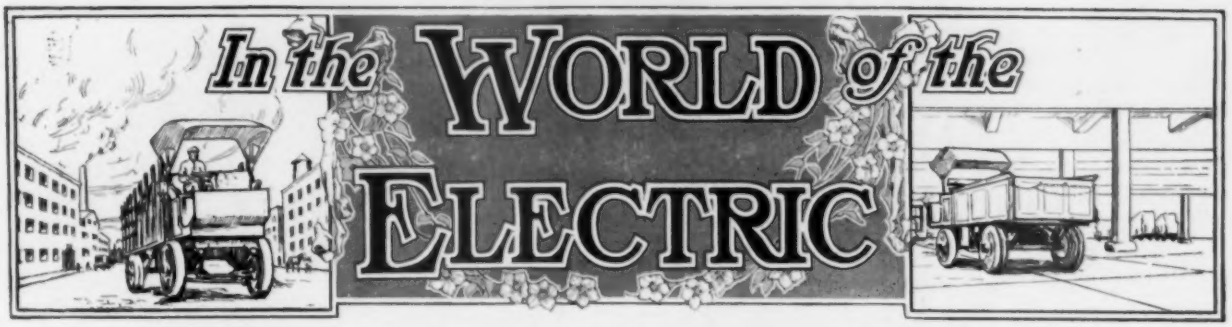
Many other general tendencies were evident at Olympia, but none such as to have any great bearing on the commercial car.

THE GERMAN SUBVENTION TRIALS

In about 1905 the French Military authorities stood pre-eminent in the attention that they were giving to the commercial car for military work, but for the last four years no country has done more than Germany in this direction. Like all other European countries the German method has taken the form of subsidizing on generous terms (already published in the "C. C. J.") the owners of gasoline trucks which comply with the requirements of the German war authorities. While these requirements have exercised a powerful influence towards standardization of detail, and the subvention trials which they ran recently introduced still further regulations of standardization, some of the main requirements have varied from time to time. For the last two years the tendency has been towards the decrease of weights—both tare and useful load.

For German military work each car is coupled to a trailer, the pair regarded as a self-contained unit called a motor train. In 1910 the total loaded weight of the motor vehicle was reduced to 9 tons, and this year it has been reduced to 8, while the maximum unladen weight allowed to the trailer is 2 tons and useful load 3½ tons, allowing a useful load of about 7 tons to the complete unit. Seeing that the cars are expected to travel at 10 miles an hour such weights are quite large enough for any driver to handle. The regulations remain much the same, except that the width of track has been reduced to 5.2 in. for negotiating some of the narrower mountain roads in the Ardennes and Vosges. It is worth noting that a new regulation has been introduced requiring that the design shall be so arranged as to provide for the fitting of a belt pulley on a driven shaft for driving machine tools and other stationary work if necessary, also the trailers have to be fitted with a continuous brake that can be worked from the driver's seat. Bevel axle transmission is also allowed now; hitherto the Germans have always clung to side chain drive.

This year the course of nearly 1300 miles in Central and South Germany leads over some difficult country with stiff gradients; the average run per day working out to be about 58 miles. Firms whose cars are already recognized for subvention enter a single transport unit, while other firms applying for the subsidy have to enter two. The former are made up of Benz, Bussing, Bussing-Rathgeber, Daag, Daimler (of Marienfielde), Eisenach, Erhardt, Mulag, Nacke, N. A. G., N. A. M. A. G., Podens and Stoewer, while the new comers include Adler, Ansbach and Durkopp.



Baker Four-Ton Truck and Tractor

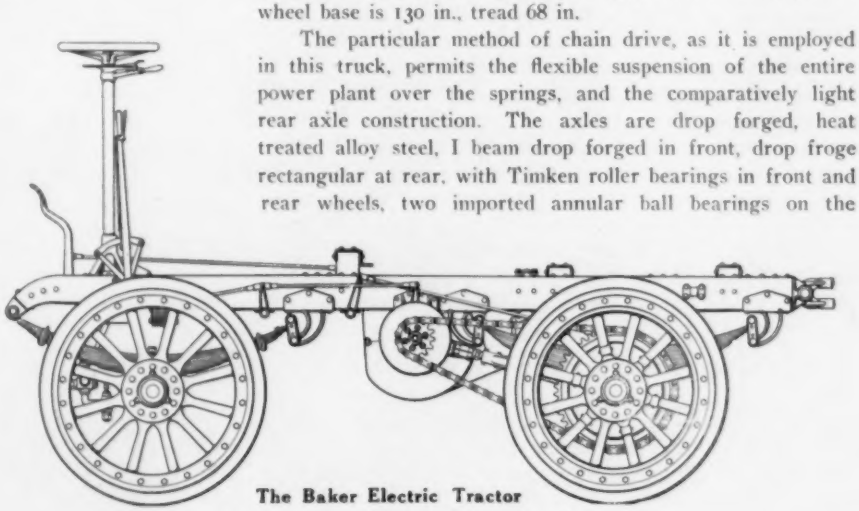
THERE are many mechanical and constructional features of merit to be found in the Baker four-ton truck chassis, and the Baker tractor, which is made in three models, by the Baker Motor Vehicle Company, Cleveland, Ohio, ranging in capacity of trailers from two to eight tons. The accessibility of all working parts of the mechanism requiring attention, adjustment or lubrication, is a feature of this truck. Every part is conveniently accessible from the outside of the truck, without disturbing the body or the load.

The Baker four-ton truck is built oversize throughout. The springs are 3½ in. wide on this model. All of the springs are equipped with rebound clips, which keep the leaves in alignment. All springs are equipped with bushings of phosphor-bronze and hardened and ground spring bolts. Lubrication is obtained by the use of compresssion grease cups. All members, attached directly to the frame proper are hot-riveted and all parts which are bolted together, have positive locking devices.

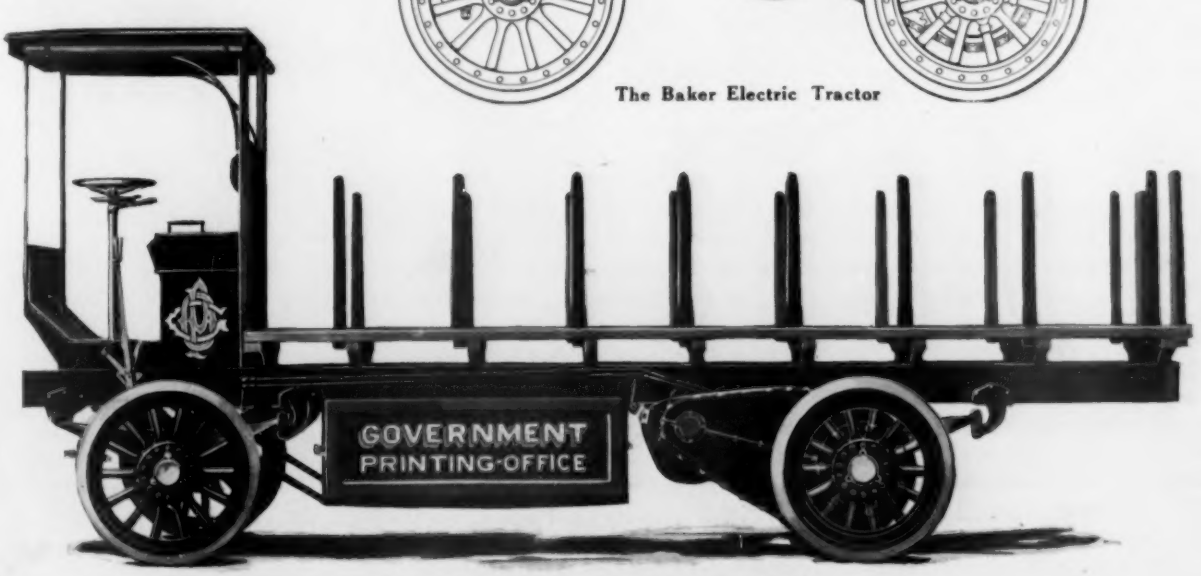
A feature of the four-ton Baker truck is the braking mechanism. The brakes are in two sets of an internal expanding type, operated on each rear wheel. Each is operated independently, and each set is connected with an equalizing bar.

The mileage of the truck is 50 miles on one charge of the battery, and its speed when loaded is about 9 m. p. h. The clear carrying capacity of this truck is about 60 in. wide by 180 in. long. It has a road clearance of 12 in., and carries a battery equipment of 42 cells of 17 plate lead battery. Its wheel base is 130 in., tread 68 in.

The particular method of chain drive, as it is employed in this truck, permits the flexible suspension of the entire power plant over the springs, and the comparatively light rear axle construction. The axles are drop forged, heat treated alloy steel, I beam drop forged in front, drop froge rectangular at rear, with Timken roller bearings in front and rear wheels, two imported annular ball bearings on the



The Baker Electric Tractor



Baker Model "CC" Truck With Stake Body

motor and four imported annular ball bearings on the jack shaft. The brake supporting device for alignment of the axles and the method of measuring distance between center of drive and driven sprocket are constructed for necessary rigidity, positive alignment and required flexibility. The springs are relieved from all drive and braking stress, and are mounted directly beneath the chassis frame. The motor is of the four-pole series wound type. It runs on imported annular ball bearings which eliminate wear and friction.

The transmission is obtained by means of a Renold silent chain, connecting the motor to the counter shaft. This chain runs in oil, and is encased in a dust and oil proof aluminum housing.

The controller is of the continuous torque drum type, giving speed changes without arcing or fusing, and is encased in a dust and water proof aluminum case, which provides five speeds forward and three reverse. A special safety device prevents accidental slipping into the reverse position. No pedals or switches are used in connection with this controller. The controller is firmly attached to the front part of the chassis frame.

All wiring is acid and weather proof, so placed that it is free from all mechanical stress or friction. It is provided with solid copper terminals, permanently soldered to the wiring.

Another feature of the truck is that the battery is side dismantling. This underslung cradle which holds the battery is so constructed that it can readily carry the burden imposed upon it. Its rigidity is assured by the support given it by two longitudinal channel section steel braces which run from its forward end to a section of the chassis frame.

The Baker electric tractor, which is built in three models, has many advantages for the city contractor and other men engaged in lines of work involving a great deal of heavy teaming. This type of truck has a capacity to pull a load out of a hole or up a short hill such as often encountered in this kind of service.

E. V. A. A. MEETING

The Electric Vehicle Association of America held its meeting at the Engineering Societies' Building, 29 West 39th Street, New York City, November 26th. Arthur Williams, of the New York Edison Company, the new president of the Association, presided for the first time in his new capacity. The papers which were read at the Third Annual Convention held in Boston in October were discussed. In one of the papers dealing with the cost of electric vehicle operation it was stated that a 1000-lb. wagon effected a saving of $400 a year over a 1000-lb. horse equipment, and that a five-ton electric truck effected a saving of $1100 a year over a horse equipment capable of doing the same work. These figures were gone into thoroughly and found to be correct. Advertising was one of the important matters brought up. It is expected that $100,000 will be raised for advertising next year, instead of $50,000, which was last year's advertising appropriation.

A standard design for an official garage sign was adopted. It consists of white letters reading "Electric Vehicle Charging" on a blue background, with the emblem of the Association in the center. The sign is to be four feet long and two and a half feet wide. It will be sent to garages everywhere in the United States which have electric vehicle "lunching" stations.

ELECTRIC MOTOR CAR CLUB OF BOSTON

Boston's electric automobile dealers and allied interests changed the name of their organization from the "Electric Vehicle Club of Boston" to the "Electric Motor Car Club of Boston" at a meeting held November 14th. The principal feature of the new constitution is the division of membership into three classes, namely:

A.—Those who derive an income resulting from the sale of electric automobiles and accessories.

B.—Private owners and operators and their representatives.

C.—Representatives of the trade or daily journals.

The constitution also provides a financial basis for making the Club self-supporting.

John A. Voodry delivered an address on "Salesmanship," and F. D. Stidham, of the Auto List Publishing Company, spoke of the need of a complete list of charging stations for the Boston territory.

The officers of the reorganized club are as follows: President, Day Baker; Vice-President, E. S. Mansfield; Secretary, H. F. Thomson; Treasurer, J. S. Codman. The Executive Committee includes the officers and F. N. Phelps, Morton J. Fitch and F. J. Stone.

Detroit Electric Truck

This truck, in the service of the Robert Simpson Company, Toronto, Ont., is manufactured by the Anderson Electric Car Company, Detroit, Mich. This vehicle is somewhat peculiar in respect to its body design, having a cab for the driver and also another body, separate from same, for carrying the load; it is used in the furniture-moving business. This machine has sixty cells, A-6 Edison Batteries, and is equipped with Goodrich tires.

The successful chauffeur does today what the driver has to put off until tomorrow

Electric Design for Electric Vehicles

BY W. H. CONANT

Member Society Automobile Engineers

ITTLE has been written on this subject because the limited number of manufacturers in the electric vehicle industry have been busy discovering the best combinations and profiting themselves by the information thus obtained. This is only natural in a new competitive business which has been fully occupied in creating and filling a demand for its product.

The gradual convergence in design of widely separated engineers, working independently over a period of years and beginning along totally different lines of thought, indicates a fairly settled group of principles. The endeavor here, therefore, is to record them and include such results of individuals as may seem to be in advance of their fellows. No attempt is made to take up mechanical questions, except those inseparably connected with electric features, for the problems of this nature are but similar to those of gasoline vehicles, about which so much has been written.

Weight and Load

The first matter to be decided in designing an electric is weight. Whether of the pleasure or commercial type weight of load to be carried and of complete vehicle must be estimated within about five per cent. Nothing besides the gear ratio has more to do with producing the results hoped for than the accurate figuring of ultimate weight. The reason for this lies in the characteristics of series-wound, direct-current motors, the speed of which varies inversely as the horsepower produced. If a given speed of vehicle and consumption of electricity, or mileage per charge, are figured on without the most careful consideration of total weight the actual results may fall so far short of expectations as to end in practical failure.

A definite "live" (or useful) load in pounds must be set down as the first step. An estimate of the weight of finished car with battery should then be made and this can only be done by experience or investigation. Where experience is not available, the weights of existing cars can usually be obtained and averaged for preliminary purposes. If radical changes in design over existing models are contemplated, due allowance plus or minus should be made.

Speed

Speed is the second factor to settle and this, together with the weight, determines horsepower required. Speed of electric vehicles is a most elusive quantity to the layman, principally because the series motor is not well understood. Since most commercial motors for driving machinery, elevators, etc., are of the constant speed, compound-wound type, the general impression is that a vehicle should have a certain, nearly constant, speed good for all conditions and grades. Series motors are used because of their higher efficiency and it is possible to use them because on vehicles they never have opportunity to run without load. "Load" in this case refers to the effort required to move the vehicle rather than the live load.

Efficiency is of first importance here, since the object is to produce the greatest amount of useful energy from a given and limited amount of potential energy stored in the battery. Just the opposite of gasoline engines, the prime characteristic of series motors is the development of greater horsepower as the speed decreases. Therefore, as the vehicle requires greater power for bad roads or grades, it slows down automatically and in a fixed relation to the power demanded.

As a result of this condition, speed must be figured with relation to level hard roads, preferably asphalt. More designers have probably gone wrong on speed than on any other feature, partly because of the insistent demand from the buying public and partly from the apparently simple problem it presented. The relation between speed and power is not entirely agreed upon by engineers. Some claim that horsepower varies as the weight times the square of the speed, while others have worked out their own formulae from extensive experiments. Perhaps the reason for this difference of opinion is the immense difficulty of obtaining comparative results from tests because of variation in weather and pavement conditions from day to day, with all the problems these variations introduce.

A reasonably satisfactory formula is:

$$\text{Horsepower} = \frac{\text{D.B.P.} \times \text{Miles per hour}}{337{\cdot}5\ ^{*}}$$

Where

D.B.P. = W x T

W = weight of vehicle and load in 1000-lb. units.

T = traction (varying from about 13 to 20)

*337·5 = 375 x .9 where 10% is allowed for transmission losses.

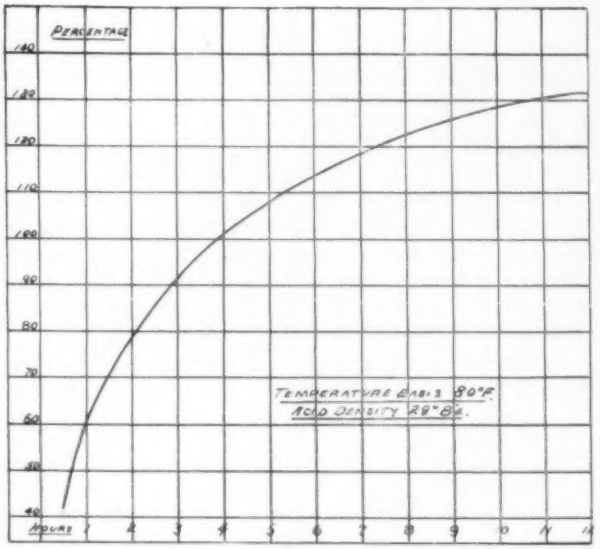
Traction as used in this formula, is made up of three factors:—

1. Rolling friction,
2. Bearing friction and
3. Wind resistance.

Motor

With horsepower determined for normal conditions, the next step is the selection of a motor. The history of the industry is as much a steady advance in the knowledge of motor design and selection as anything connected with engineering. Beginning with the early days, absurdly inadequate motors were applied. Then the pendulum swung too far and larger ones than necessary were used but of inefficient design When more attention was paid to efficiency, some designers went back to small motors with only moderate success. Today, motor efficiency is good and designers have come to using proper sizes, so that no trouble of any nature need now be experienced with that part of the car.

Manufacturers of vehicle motors supply blue prints showing characteristic performance curves of their different sizes.



Characteristic Performance Curves

The ampere rating given to series motors is that at which they will operate continually without a temperature rise of more than 25° Centigrade above the surrounding atmosphere. To determine the proper motor, see that the point on "Brake Horsepower" curve, corresponding to the horsepower worked out, does not show a current draw in amperes greater than the rated number. It need not be much, if any, less but should not exceed it. The best motor will show the best torque at any given current, which is to say that it is most efficient.

It will be noticed from a study of motor curves that the rating for continuous operation is usually at a point on the efficiency curve just before the latter reaches its maximum height. Where this is not the case, a rating in amperes to correspond with the desired horsepower should be selected which is below the maximum efficiency and before, not after, this curve has touched its highest point.

The reason for this will be evident after a brief consideration of vehicle operation. The "normal running current" is, to all intents and purposes, the minimum current taken by the motor. Except when running down grade, and at such times the power should be shut off entirely, the amperage is never less than normal. With every condition but that of running steadily on level asphalt it is above normal. Every time the vehicle is started from rest or the speed increased from one controller step to another the current also exceeds normal by 50 to 300 per cent. No consideration is made of the periods during which vehicle is operated at a controller speed less than normal for that is a wrong condition and should be discouraged. While the draw on the battery may be less, the vehicle efficiency is much lower because of cut-in resistance or other devices.

It will be seen, therefore, that with every condition but the ideal increasing the load, efficiency must be carefully considered at points above the normal. With this normal point below maximum efficiency, it will be seen that as the load becomes greater, the efficiency increases up to the maximum and then begins to decrease. An ideal condition would be to possible, the advantage of such a condition can nearly be realized by selecting a motor in which the estimated maximum current draw under any ordinary conditions shows an efficiency nearly the same as for normal current draw, with highest efficiency at some point in between. This is not impossible. There is, for example, a standard vehicle motor having its highest efficiency (84 per cent.) at 40 amperes. At 30 amperes it develops 2 brake horsepower, which is 83 per cent. efficient, and at 58 amperes, or nearly 100 per cent. above normal, gives 82 per cent.

Opinion and practice are divided on the subject of motor speeds. The higher speed motors are more efficient, are better for grades and starting but mechanical limitations frequently make them undesirable. Where formerly speeds ranged from 650 to 1100 revolutions per minute, modern practice varies then from 1000 to 2000. Normal speeds below 1000 are hardly as satisfactory for most conditions and should be avoided when possible.

Mistakes have been made, especially on commercial vehicles, in selecting motors of only sufficient size for ordinary conditions, with no thought for the abuse by drivers, bad roads, snow or overloads. Due allowance should be made for such unavoidable factors, without too much sacrifice of efficiency under normal conditions.

The best type of motor to select, as proven by long experience, is one with the following features:

Four poles	Ample coil bindings
Laminated pole pieces	Two sets of brushes
Medium air gap	Pig-tail brush holders
Oil protection	Annular ball bearings
Removable armature shaft	Self lubricating
Wide commutator	Water tight case
Ribbon windings	Large inspection door.

Consideration is given only to one motor per car. The earliest designs provided two, one driving each rear wheel. Some makers still cling to this arrangement, setting forth very reasonable claims for so doing. No differential is needed; starting torque is bettered somewhat by connecting armatures in series and damage to one motor will still permit vehicle to reach home. These advantages are much more than offset by the increased efficiency possible in a single motor of, say, double the capacity, besides making a saving in weight and combining the two independent reductions into one. Moreever, when one motor in a double equipment gives out, the added load on the other will usually put it, too, out of commission. Since motors are being built so rugged, this provision for emergencies is of little value.

(*To be continued.*)

Sheffield Electric Steel Castings Company, Ltd., Sheffield, Eng., is the manufacturer of electric steel wheels of various types for motor lorries, motor wagons, omnibuses and other industrial vehicles.

Correction: In describing the Lambert Commercial Cars in our November issue on page 29, we printed a few incorrect specifications of the motor, used in the 2½-ton model. This model contains a new motor which has a bore of 4½ in. and a stroke of 5 in. The ignition system is of the Briggs dual type. The chassis has a wheel base of 146 in. and is fitted with 36 in. x 4 in. tires on the front wheels and 36 in. x 3½ in. dual tires on the rear. The loading space is 12 ft. in the rear of the driver's seat by any width desired. The chassis lists at $2300, without body.

Principles of Lubricating Systems

BY C. T. SCHAEFER

Member Society Automobile Engineers

THERE are a great variety of lubricating systems, making it quite difficult to classify them; however, the functions performed are practically the same in the various systems. The functions are to deliver a quantity of oil to each of the working parts of the engine, such as the crank shaft and connecting rod bearings, cylinders, pistons, valve gear and cam shaft.

In commercial car service the conditions of operation are anything but favorable and combined with poor maintenance materially reduces the motor efficiency, if the lubricating system does not meet the requirements.

The object of the lubricating system is to eliminate the friction, which is always present between two moving parts that rub upon each other. Every metal part which moves upon another instantly develops friction when these surfaces are not protected with a lubricating substance. Friction in reality is heat, which in a short period will reach an intense degree, at which time the surfaces are broken down and if the rubbing continues will be completely destroyed. At first small particles of metal are torn from the surface and these cut and abrade the bearing as it revolves. As the surfaces roughen, the friction increases enormously until it reaches the fusing point of the metal. Thus the opposed surfaces weld into one mass and all bearings, moving parts, and other parts communicating power to them are completely destroyed. Thus it can readily be understood that the function of a lubricating system is to create a film of lubricating substances between the surfaces rubbing together and in this way minimize the friction or heat.

Overlubrication also presents some difficulties. Carbon, which enters largely into the composition of oils, is separated by the action of the intense heat in the cylinder and deposited on the walls of the combustion chamber, spark plugs, etc. This carbon, becoming incandescent, will fire a charge prematurely, causing excessive strains on the piston, piston pin and crank shaft. It will also cause the motor to pound, foul the spark plugs and cause the motor to overheat.

All bearings are subjected to a pressure and the effect of this pressure is a tendency to separate the mocules of the lubricant, forcing enough out from between the surfaces to allow the metals to come in contact. The value of an oil, therefore, is its ability to resist the tendency to be forced out of the bearing. The oil has a tendency to resist this separation of the mocules, which is called the viscosity of an oil; consequently, the higher the viscosity, the more suitable it is for bearings of a heavy load.

The oil must also have a high flash point due to the heat in the cylinder on the power stroke. If the temperature is raised sufficiently and the substance vaporized the force of co-

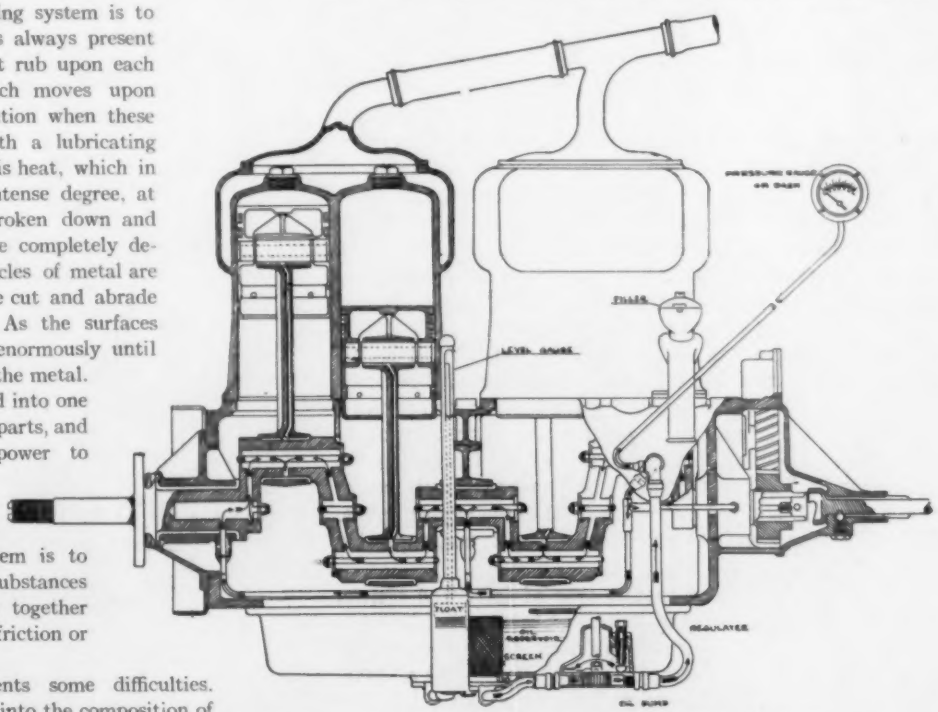


Fig. 1. The Marmon Oiling System

On the Marmon commercial cars the force-feed system is used, providing a forced circulation to the main and connecting-rod bearings and the piston pin and cylinders, the cam shaft and other parts being lubricated from the spray of the connecting rods. A gear pump is used in connection with a pressure gauge on the dash, making a positive system of lubrication. The system is provided with a by-pass valve to regulate the pressure and all leads are placed inside the case.

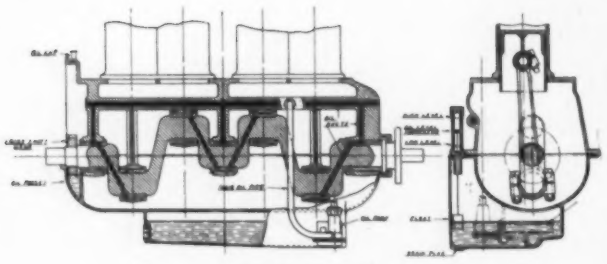


Fig. 2. The Palmer Oiling System

This depicts the popular type of force-feed system. The main and connecting-rod bearings are fed by pressure through a duct cast integral with the crank case and a drilled crank shaft. The oil working its way from the connecting rods is in the direction of centrifugal force and picked up by the pistons and other moving parts. The entire system is built into the motor, eliminating any danger of broken oil leads.

hesion, called viscosity in oils, is overcome entirely. Various authorities give the flash point of oils for motors of the sizes used on commercial cars as 400 degrees Fahrenheit, which provides a reasonable amount of safety.

As stated above, the functions performed are practically the same in all systems; however, the methods of obtaining these vary considerably in the various systems. In order to depict the various methods of obtaining efficient lubrication for commercial car engines, the writer is presenting herewith a number of illustrations, which he believes cover all the prominent systems on commercial car motors, this article being confined to systems built into the motor and to cars of the present day.

Fig. 1 depicts a force feed system in which the oil is drawn from a reservoir cast integral with the lower half of the case by means of a gear pump. This pump forces the oil through an oil lead placed inside of the case, which has branches communicating with the main bearings. From these bearings the oil is forced through the hollow crank shaft to the connecting rod bearings. The connecting rods have copper tubes riveted to their body permitting the oil to be forced up to the piston pin bearing. The main branch is connected with a pressure gage on the dash, giving the pressure of the oil under all conditions. This pressure varies between 4 and 8 lbs., depending upon the motor speed, and any excess pressure must be returned to the crank case. The regulating valve on the pump is used for this purpose. When the pressure exceeds a certain amount, the valve opens, forming a by-pass for the excess lubricant. A part of the oil forced through this hollow shaft works its way out of the connecting rod bearings and causes a spray of oil for lubricating all other working parts. The pistons are provided with collector grooves for lubricating the cylinder walls. The excess oil flows back to the reservoir, where it is thoroughly strained and recirculated to the working parts. This system is somewhat complicated and, of course, expensive to install in an engine.

In Fig. 2 is depicted another type of force-feed system, differing somewhat from the above and being somewhat simpler in construction. A gear pump driven by spiral gears from the cam shafts is used for supplying the pressure, the oil passing through a duct cast integral with the upper half of the case. This duct has three branches, which communicate with the main bearings. Diagonal holes are drilled through the crank shaft arms, connecting the main bearings with the connecting rod bearings, thus supplying oil under pressure to all crank shaft bearings. A portion of this oil works out of the bearing and by the centrifugal force of the crank shaft; this is thrown in the form of a fine mist, which fills every crevice in the engine and lubricates the cylinders, pistons, cam shaft, valve gear and all moving parts. The surplus oil drains back to the reservoir where it is again strained and recirculated. An oil cup is used for supplying an additional amount of oil to the timing gear compartment.

Fig. 3 depicts another force-feed system, in which two plunger pumps are utilized to supply the oil to the bearings under pressure. One pump supplies out through a lead, which is connected with the dash board sight, and then to the crank case, while the other lead is direct to the case. The spray of oil from the connecting rods is used to lubricate all other working parts as in the force-feed systems depicted above. In this system the excess oil returns to the reservoir through a standpipe, which extends to within 3/8 in. of the bottom of a water compartment, and owing to the difference in specific gravity of water and oil the latter rises to the top of the water and returns to the main reservoir. During the passage of the lubricant through the water, carbon, which is collected by the lubricant while performing its functions, is precipitated to the bottom of the compartment, which at certain intervals can be thoroughly cleansed.

Fig. 4 depicts a constant level splash system. Two plunger pumps placed in the lower half of the case and driven from eccentrics on the cam shaft, pump oil from the reservoir through two leads. One of these leads supplies oil to the timing gear compartment, while the other supplies oil to the rear end of the case. Splash troughs are cast integral with the lower half of the case, into which the dippers on the connecting rod project. These dippers throw a spray of oil into the pocket cast integral with the main bearing housings and feed to the bearings. The cam shaft and all other moving parts are also lubricated from the spray of the connecting rods. The case is provided with overflow pipes, which communicate with

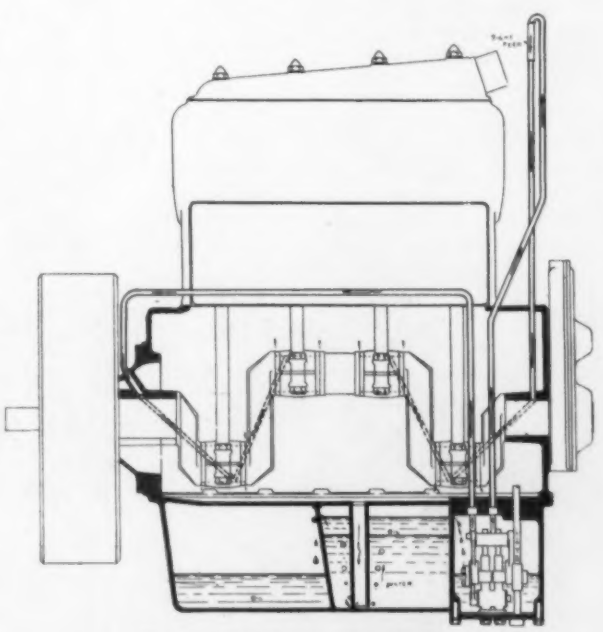


Fig. 3. The Natco Oiling System

This depicts a combination force-feed system, oil being forced to the two main bearings by two plunger pumps, gear-driven from the cam shaft. A filtering compartment is also provided for separating the oil, water and sediment as well as acting as cooling medium. In this system all leads are placed on the outside of the case, the forward one being connected with a tell-tale on the dash.

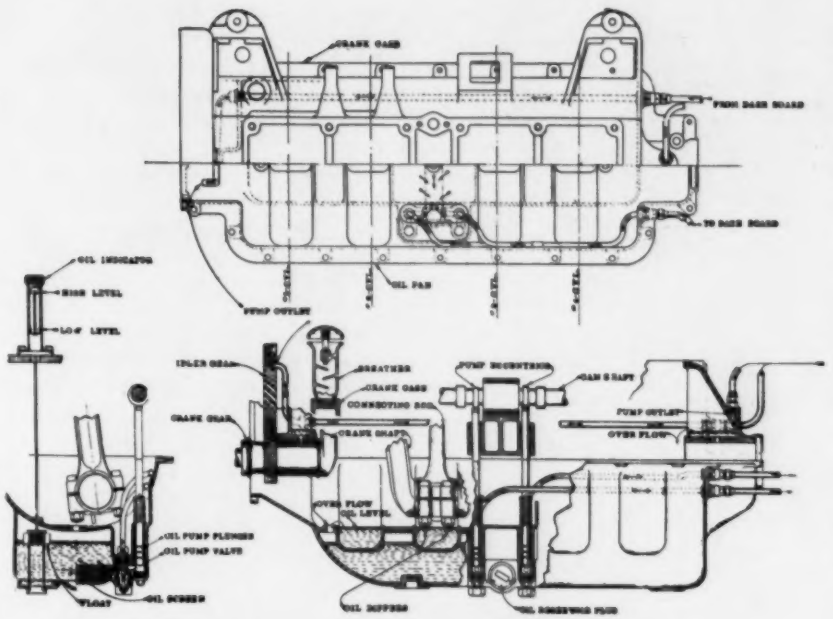


Fig. 4. The Continental Oiling System

This system is of the constant-level splash type, in which all moving parts are lubricated by splash from the connecting rods. The connecting rods are provided with scoops for distributing the oil. Two plunger pumps are used for maintaining the constant level. One of these pumps supplies oil to the timing-gear compartment, while the other supplies oil to the rear end of the case. On some trucks these leads are connected with tell-tales on the dash, while in others direct connections are made.

the reservoir, permitting the pumps to maintain a constant level of oil in the case. In this system the oil is also strained before being recirculated. This system is found on a number of trucks; in some cases the two leads from the pumps are connected with sight feeds on the dash, while in others the leads are direct from the pumps to the sublet points.

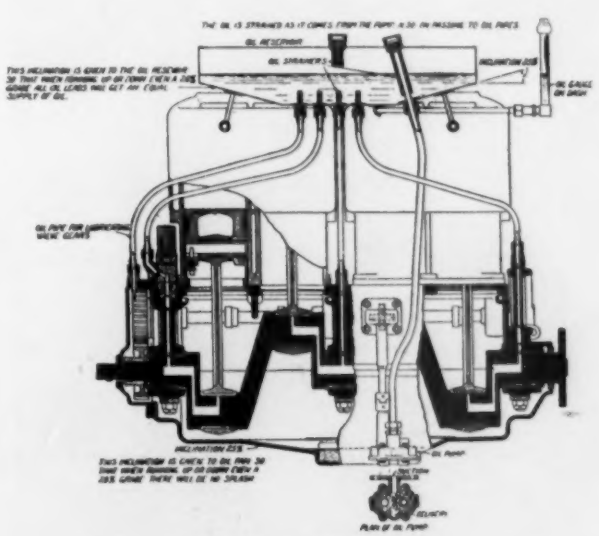


Fig. 5. Pierce Oiling System

On the Pierce five-ton truck a gravity system of lubrication is used. The surplus oil in the reservoir is pumped to the gravity tank placed at the top of the cylinders. From this tank oil leads of large diameter lead to each main bearing and the timing-gear compartment. The crank shaft is drilled to permit the oil to pass from the main bearings to the connecting-rod bearings. All other moving parts are lubricated from the spray of oil leaving the connecting rods. A tell-tale placed on the dash shows the oil level in the tank and thereby indicates the working of the system.

Fig. 5 depicts a gravity-feed system using a gear pump for supplying oil to the gravity tank from the reservoir in the lower half of the case. This gravity tank is placed at the top level of the cylinders and has an oil lead of large diameter to each of the main bearings and the timing-gear compartment. The delivery pipe and leads are provided with strainers, so that the oil is thoroughly strained before being recirculated. The crank-shaft journals and short arms are drilled through, so that the oil can pass from the main bearings to the connecting rods, centrifugal force being relied on to carry this oil to the connecting rods. Part of this oil works through these bearings and creates a spray, as in the force-feed system. This spray lubricates all other moving parts. It will be noted that the shape of the oil tank is such that when the car is moving up or down grade all bearings will receive an equal amount of oil. An oil gage on the dash shows the amount of oil in the tank, indicating that the pump is doing its work.

Fig. 6 depicts another force-feed system in which a gear pump is used to force the oil to the main bearings through separate leads placed on the outside of the case. The general operation of the system is similar to those depicted above, having a drilled crank shaft for supplying oil to the connecting rods and relying upon centrifugal force to distribute the oil to all working parts. A sightfeed is

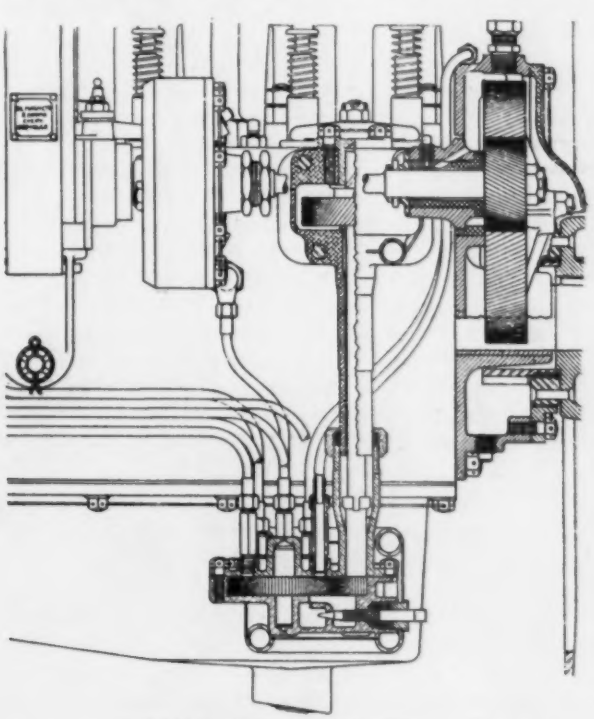


Fig. 6. The Franklin System

Individual leads are used for the main bearings, combining a distributor and gear pump for the pressure supply

placed on the dash to show the exact amount of oil fed to each bearing, while the pump has an adjustment for controlling the amount of oil delivered to each bearing.

Fig. 7 depicts a constant level splash system using a plunger pump for maintaining the constant level of oil in the case, while the reservoir is placed at the side of the upper half of the case instead of the lower half. A sight feed providing an adjustment for the amount of oil passing to the crank case is placed on the dash. This sight feed has a return pipe for the excess oil delivered by the pump.

In connection with all the above lubricating systems, breathers are provided for replenishing the oil supply in the reservoir, while oil level gages are placed in close proximity to these, showing the level of the oil in the reservoir. If this level is maintained between the high and

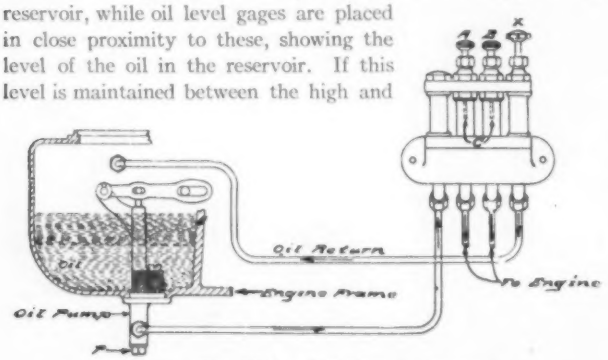


Fig. 7. The White Lubricating System
The White system is of the combination force-feed and splash type, combining a plunger pump and an adjustable dashboard sightfeed

low-level marks on the gage, the operator is assured of having sufficient oil to insure proper lubrication.

The constant level splash and force-feed systems are by far the most popular, and as pumps are resorted to to feed the oil, the general tendency is to provide oil leads of a large diameter and to reduce the number of bends to a minimum. Whenever bends are necessary they are made as large as possible, to reduce the obstructions and resistance to a minimum.

From the above it can readily be understood that the constant level splash system is the simplest system in use today; its operation is mechanical and the attention required is reduced to a minimum, and at the same time is quite economical of oil.

The advantages of the force-feed system are that the oil may be forced to the bearings under considerable pressure, reducing the danger of the oil being forced out by the bearing pressure. It is generally agreed that with pressure feed the specific pressure on the bearing can be made greater and the bearing will last longer. On the other hand, this system is more expensive to install and less economical of oil. The force-feed system is better adapted to commercial car engines, which operate at or near the full load for a considerable length of time.

The gravity system has the advantage of keeping the lubricant in a liquid state during cold weather, as the tanks are always placed near the top of the cylinders where an even temperature may be maintained. This system has the disadvantage of being complicated in that all pipes must be placed on the outside of the motor, where they require more attention. The economy is about at par with the constant level splash system.

Comparing the various force-feed systems depicted above, it may be stated that in Fig. 1 a larger crank shaft is required. This is due to the weakening of the shaft, caused by drilling the radial holes, which reduce the portion of stock at a certain section, usually at the point of maximum stress. The diagonal holes, as depicted in Fig. 2, are not so objectional, as it does not have such a weakening effect; it is also a cheaper and simpler construction.

In all bearings having a nearly uniform load, the oil should be fed to the side opposite to where the pressure comes. However, in gasoline motors, the pressure constantly changes from one side to the other, and it does not make any difference if the feed is from either side, both methods being equally successful.

Various methods of splash lubrication may also be found, in which but one lead to either front or rear of the case is used, while in some few the flywheel is used as a pump, delivering oil to a series of troughs from where it enters the splash compartment.

The most popular types of pumps are the piston and gear pumps, which are used in connection with either force-feed or constant level splash systems, these pumps being very successful in either system.

Stewart Bank Wagon
Barred with iron, protected by gratings at front and rear, and guarded by armed officers, this specially built Stewart delivery truck is being used by the Manufacturers & Traders Bank, of Buffalo, New York. The banks have been one of the latest business institutions to realize the possibilities of motor delivery. The car is equipped with patent locks, opening from the inside. The interior is protected by hinged grating behind the front seat, as well as by bars over the windows. The Safety Deposit Department uses it for delivering and calling for valuable articles. It is also employed for making collections at different banks and for delivering currency to various factories for their payrolls.

A mischievous cur must be tied short—use a governor on your truck

TRUCK ACCESSORIES AND APPLIANCES

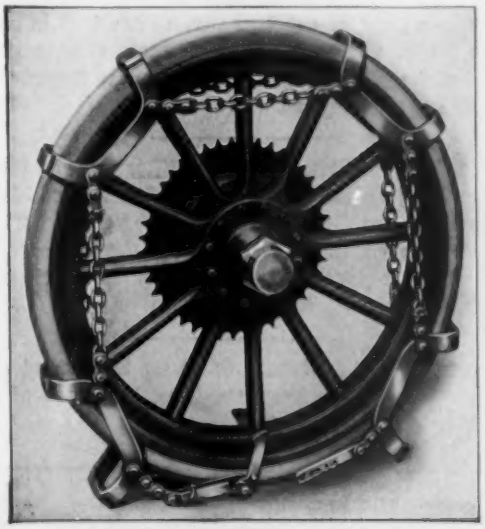
THE NEW FEDERAL GRIPS FOR SOLID TIRES

The Federal Chain & Manufacturing Company, Springfield, Massachusetts, which has recently acquired all rights to manufacture Gaylor Grips, has also added the Federal Grip to its regular line.

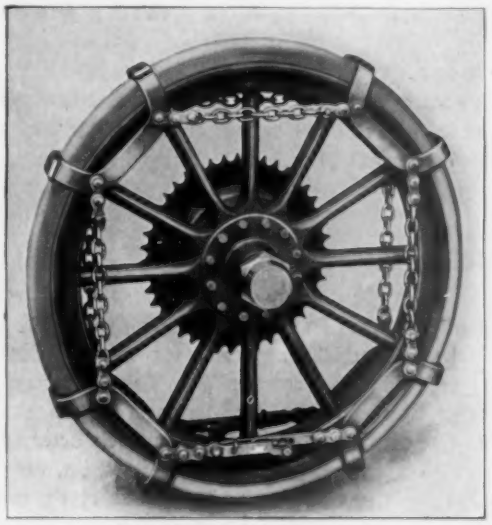
Federal Grips, it will be observed, are made in units consisting of two steel cross-members integrally connected by two side arms. These are secured at the four corners by adjustable connecting chains to other similar units constituting the complete grip. It will be seen, therefore, that each gripping unit forms a solid structure, the cross-members of which cannot stir from their fixed positions, and remain at all times radially with the wheel. It will be noticed also that the solid double-grip units are flexibly connected by chains, which distribute the driving strain equally around the entire wheel circumference.

Federal Grips are so constructed that the gripping portion which crosses the face of the tire is double the thickness of the steel side arms, thus giving a very effective driving medium and at the same time avoiding unnecessary weight and thickness on the sides of the wheel. This is an important detail when the grips are used on vehicles which have driving chains running in close proximity to the rims. The under surfaces of all cross-members are rounded where they come in contact with the tire, so that they cannot injure the tire under any circumstances.

Federal Grips fold up in a very compact form when not in use, and can be conveniently carried on the car. They can be attached to the wheel in two minutes. It is only necessary to place them evenly on the wheel as shown in the illustration, then bring the free ends together at the bottom and engage the lever fasteners on each side, when they are ready for use.



The Federal Grip Ready to be Locked



The Federal Grip Attached

Nickel steel is used exclusively in the manufacture of Federal Grips, receiving a careful heat treatment to produce a tough non-crystallizing steel and one that will give great mileage.

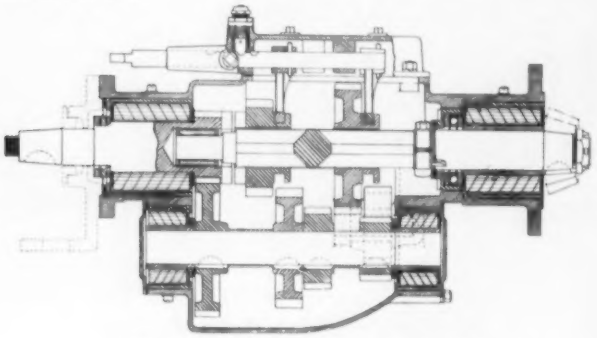
Federal Grips are quick attachable in every sense of the word, and in application no tools are required but the hands. As solid tires wear down to a much greater extent than do pneumatic tires, the connecting chains of Federal Grips are provided with means for easily and quickly securing an adjustment for the greatest change in tire diameter due to wear.

COVERT TRANSMISSION

The Covert transmissions manufactured by the Covert Motor Vehicle Company, 1422 Ford Building, Detroit, Mich., are built in many different styles and sizes, to be adapted to as many different conditions and requirements. The latest model is made in four sizes, namely, 20 h. p., 30 h. p., 40 h. p. and 50 h. p. capacity and is known as model O.

Gears are nickel steel carbonized, heat treated, and accurately ground to fit shafts and receive bearings. The shafts are nickel steel, heat treated and ground to limits of one-half thousandth. Hyatt High Duty Type Roller Bearings are used

throughout, consisting of nickel steel rollers, heat treated and accurately ground and solid steel linings, hardened and ground inside and out.



The Covert Transmission, Model O

This transmission has been so designed as to give access to all parts and permit of adjustment. As shown, the splined shafts are mounted on Hyatt High-Duty Roller Bearings, and have provision made for adjustment.

The case is of a neat compact design, made of light malleable iron castings of exceptional toughness and strength.

The features of this transmission are accessibility for adjustment or removal of parts and arranged for adjustment of bevel pinion.

THE EUREKA NON-SKID FOR SOLID DUAL TIRES

As will be noted from the illustration, the Eureka Non-Skid device is especially applicable for use with dual tires such as used on heavy commercial vehicles. It consists of a series of hardened steel drop-forgings, in the shape of diamond frames with projecting bars on their outer surface, mounted on pieces of steel chain, varying in length according to the size of the weeel to be fitted. The diamond frames are shaped to the periphery of the tire, and have a large bearing surface on the tire, which prevents damage to the rubber.

The Eureka Non-Skid

These drop-forgings are evenly distributed along the length of the chain, nine to twelve being employed on each chain. Inserted within the frame of one of the diamonds is a steel drop-forged turnbuckle for adjusting the tension on the chain.

A hook of the type known as a brewer's hook, attached to the end of each chain, gives a very quick attachment to the wheel, and once closed, remains so, the pull on the chain tending to keep the hook fastened. The turnbuckle can then be used to pull the chain up tightly on the wheel as the device should not be run slack.

The Eureka Non-Skid is listed at $25 for 36 in. tires or under; $30 for tires over 36 in., and is manufactured by the Eureka Non Skid Manufacturing Company, 591 Bergen Street, Brooklyn, N. Y.

THE VICTOR SECTIONAL TIRE

The Victor tire is made of sections or blocks, each of which is secured in a steel channel which is shrunk on the wheel, and the blocks are held in place by locking bars. This fastening device is a high test carbon steel rod 5-16 in. in diameter, vulcanized in the blocks and projecting ¼ in. at either end. The projecting rods are inserted in sockets in the locking bar, so that when the bar is drawn down there is a constant downward pressure on the rods, holding the blocks securely until worn out. The locking bars are of high-test steel, bolted to the channel and have walls in the center which prevent any endwise movement of the rods. These bars and the side of the steel channel form a cup into which each block fits securely.

The Victor Sectional Tire

The simplicity of the fastening permits the easy removal of a block, without disturbing any of the other blocks composing the tire. This is done by simply unscrewing two accessible nuts, without jacking up the wheel. The blocks are but ⅝ in. apart, and this feature, together with the resiliency of the blocks, it is claimed, eliminates vibration.

This tire is the product of the Victor Rubber Company, Springfield, O.

REPLACING DRIVING CHAIN

When driving chains have been removed for cleaning or repairs, difficulty is sometimes experienced in replacing them. Replacement will be facilitated by wrapping the chain around the wheel sprocket and bring the ends together on the top of the jack-shaft sprocket which forms a table or anvil and renders the insertion of the connecting link easy. The future removal of the link will be aided if in replacing it the detachable side plate is placed on the outside so that the retaining cotter pins or snap springs are easily accessible. The ends may be drawn together so that the link can be easily inserted by slipping a piece of annealed wire with a loop in one end between the links of each end of the chain after passing the free end of the wire through the loop, drawing it taut, thereby taking up any slack in the chain.

THE ELECTRIC STORAGE BATTERY COMPANY, of Philadelphia, Pa., has just issued a six page booklet entitled "Instruction Book for the Operation of 'Exide' Vehicle Batteries," which gives in remarkably few words all the necessary information which the owner of an "Electric" need possess to keep his battery in good working order.

GOODYEAR TIRE & RUBBER COMPANY has started on the sixth new building this year, the latest being one of seven stories in height, 100 x 260 ft.

Spare the throttle and spoil the truck

PIERCE-ARROW TRUCK IN LUMBER BUSINESS

Four months of actual usage of a Pierce-Arrow truck by the Capitol City Lumber Company, of Hartford, Conn., which kept accurate record of the truck and also its teams has developed some surprising facts and figures. The computation in both cases is based on the total investment, insurance, interest, up-keep, repairs, etc., and the entire comparison is made in all fairness to all concerned.

It has been thoroughly demonstrated that the truck replaces five and one-half teams, and that the truck will deliver lumber at 36c per 1000 ft., while the teams cost 75c per 1000 ft., or more than twice as much.

	Pierce-Arrow Truck	Two horse Team
Total investment—with equipment	$5,362.12	$1,510.00
Total expense per day	15.26	5.63
Average mileage per day	42.5	15.
Average round trip haul—miles..	5.	5.
Average number trips per day ..	8.5	3.
Average load—dressed lumber ..	5,000. feet	2,500. feet
Average weight per load	5. tons	2.5 tons
Carrying total per day	42,500. feet	7,500. feet
Total expense per 1000 feet....	36c	75c

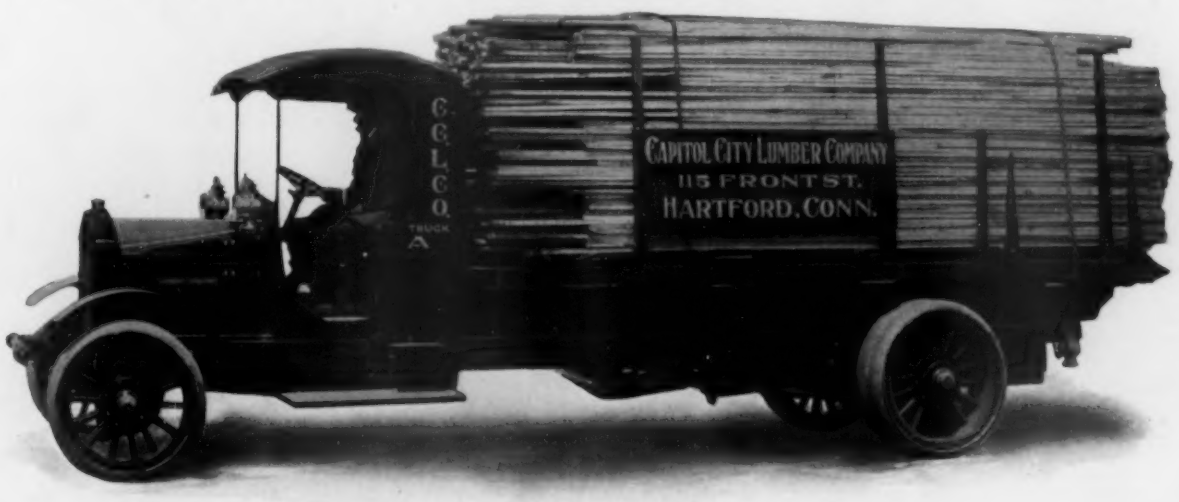
The truck is equipped with a roller body, and as an accessory, a small four-wheel loading wagon for gathering lumber about the yards and having load ready for the truck. By actual timing it has been found that it takes three minutes to transfer the lumber on the truck, and two minutes to unload, without damage of any kind to the lumber.

TWENTY-EIGHT TON LOAD ON TEN PER CENT GRADE

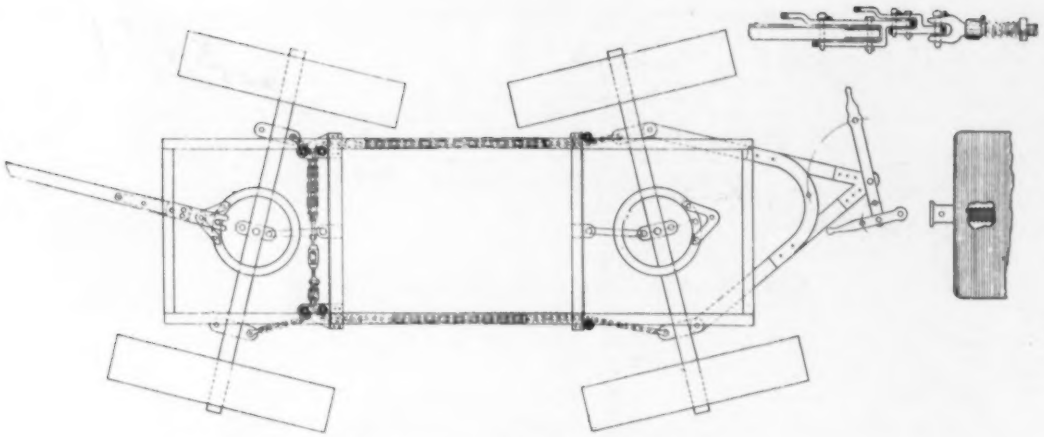
The use of trailers with motor driven trucks is still so new in this country that the recent performance of a La France truck with hydraulic transmission, in pulling a trailer is noteworthy. A demonstration was made by the Hydraulic Truck Sales Company, of New York, for Van Keuren & Son, of Jersey City, N. J. The truck was loaded with six tons and the trailer with thirteen tons of paving brick, the load being carried from the Central Railroad Station, at West Side Avenue, up Grand Avenue to Bergen Avenue. According to the city engineer, the grade on Grand Avenue between West

Trailer on Ten Per Cent Grade

In a recent test a La France truck with hydraulic transmission stopped and started on a ten per cent grade, the truck itself carrying six tons, and the trailer thirteen, twenty-eight tons in all, including the weight of the trucks.



The Pierce-Arrow in the Service of the Capitol City Lumber Company



Type of Cross-Reach Steering Gear

The trailer was fitted with the Buffalo-Pitts cross-reach attachment, so that both the front and rear wheels steer in opposite directions, causing the trailer to track

Side Avenue and Bergen Avenue varies between seven and a half and a little over ten per cent. The truck stopped in the middle of the hill, and started again without difficulty, in spite of the fact that the trailer and truck each empty, weighed four and a half tons, making with load a total of twenty-eight tons moved.

In the accompanying illustration is shown the cross reach attachment employed on the trailer, marketed by the Buffalo Pitts Company, of Buffalo, N. Y. This method of making the trailer track accurately the leading vehicle was used in the above demonstration. It will be seen that the wheels at opposite ends by means of interconnecting chains are made to turn in opposite directions at the same time, so that the vehicle follows exactly in the track of the truck. These trailers run equally well in either direction, and do not require a man in attendance.

EXPRESS AND DELIVERY COMPANIES OF BOSTON USING GASOLINE TRUCKS

IT is now a common sight on the streets of Boston to see loads of goods being transferred, in the wholesale section or in public squares, from horse trucks to motor driven vehicles. During a recent visit to the "Hub," a "C. C. J." correspondent was greatly impressed by the large number of gasoline trucks used by express companies. These fast moving vehicles are being used almost exclusively for suburban work by certain companies who gather their loads in the city, while for others the goods are carried by the commercial cars direct to suburban sub-stations where horse vans do the retail distributing. In the first case single and two horse teams go their rounds and gather from store to store the goods to be delivered in the suburbs. These wagons then report at some

Packard Three-Ton Motor Van With Trailer

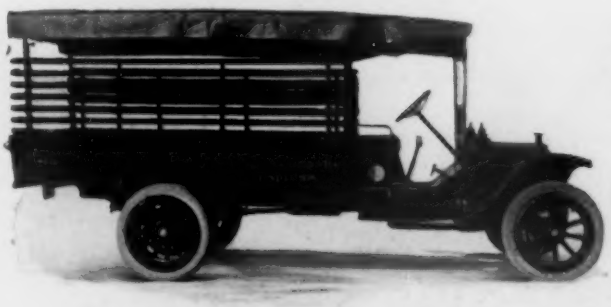
This three-ton Packard truck with trailer is in the service of the Baltimore Storage and Moving Company, Baltimore, Md., and is used for suburban and intercity hauling. The capacity of the motor van in loading space in bulk is equal to four two-horse furniture wagons or two three-horse van loads, and with a horse-van trailer attached, three van or six wagon loads can be moved at one trip.

Transferring Loads for Suburban Delivery

Gasoline trucks of express companies of Boston having loads transferred from horse wagons, in Post-Office Square. These trucks deliver daily in suburban sections thirty miles out from the center of the city.

place where a transfer of the goods can be made to the motor trucks. As rapidly as possible this change is made and the motor trucks hurry to the suburban section where deliveries begin. All points within a radius of 30 miles or more are cared for daily, such places as Sharon, Mansfield, which is 26 miles out, or Foxborough, which is 29 miles. Goods which are purchased in the city in the morning often reach their destination almost before the purchaser arrives home, and goods are always received by the next day. Such service was impossible with horses.

The Martins West Roxbury Express Company employs 1½-ton gasoline trucks for carrying the goods direct to distributing stations in the outlying sections. On questioning one of the drivers on a Saturday afternoon at about 3 o'clock, he said "I'll reach my suburban distributing point, be unloaded and back again in the wholesale district in less than two hours. My car makes three trips daily, averaging 18 miles per hour. I'll be met at the unloading point where platforms are provided, by two-horse wagons to which my load is transferred, and they make the local deliveries." These trucks are all operated on solid tires, twins at the rear.



White One and a Half Ton Truck

One of the White one and a half ton trucks, owned by the Wells-Fargo Express Company, at San Francisco, Cal. This is the first truck to be delivered of the large order for motor equipment recently placed by this company.

THE LEE TIRE AND RUBBER COMPANY, Conshohocken, Pa., recently announced a 10 per cent. reduction on the Lee Puncture Proof Pneumatic Tires.

MOTOR TRUCKS AND THE TEAMSTERS' UNION

IT has been found by fleet users that troubles with drivers are occasionally met with when the delivery system is being converted. Motorizing the equipment is occasionally made more difficult by the antagonism of old employees who are still horse drivers. The opposition to the more modern vehicle is not as a rule open and above-board, but is cloaked in such a garb that some employers have not realized that it existed, or recognizing its extent have not been able to bring it home to the offending parties.

A concrete example of the opposition to which we refer will assist the reader. A company installed a commercial car, and placed it in the hands of a competent driver. This man proceeded to get the maximum amount of work from the vehicle, and maintained a schedule of eleven trips a day. After a few weeks he came into the office and announced that he was going to quit. He would give no satisfactory answers to inquiries as to his reasons for leaving, his work having been satisfactory to the company, and his pay satisfactory to himself. He could not be persuaded to keep his place, and the oldest horse driver was promoted to the truck. At first this driver made nine trips a day, and this continued for about one week. Soon, however, the trips dropped off to eight, then seven, and finally six trips a day. The difference between the work now being obtained from the truck and the possibilities shown at first were so marked that a quiet investigation was made to determine the cause. This developed the fact that the driver was told how many trips he could make, and just how much work he had better get out of the machine. He was not allowed to produce the maximum of which the truck was capable, as the comparison was altogether too unfavorable to the horses, the truck doing too much work.

From time to time similar instances are reported, showing that there is to a certain extent a concerted action on the part of organized drivers to hold back and prevent motor trucks from accomplishing the amount of work of which they are capable. Brewers have, perhaps, suffered more from this feeling of antagonism on the part of the horse drivers than any other class.

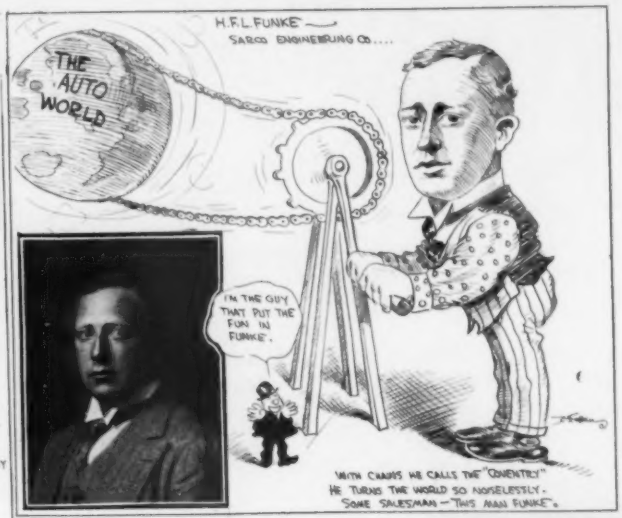
This kind of opposition will gradually die out, and firms in whose service such a feeling crops up can readily put a stop to it by suitable measures. Although we do not look upon this as a serious difficulty, it is just as well to be familiar with actual conditions,—"forewarned is forearmed."

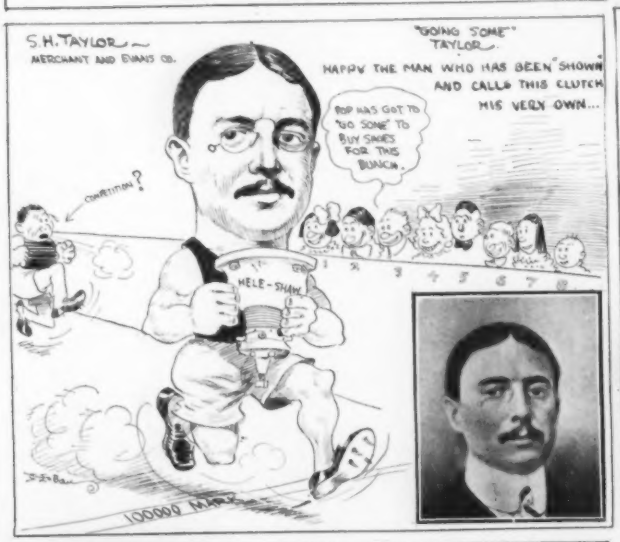
THE KNOX AUTOMOBILE COMPANY, Springfield, Mass., has made arrangements with the Canadian General Electric Company, one of the large manufacturing corporations of Canada, to act as the general agents for the Knox commercial cars and fire apparatus throughout Canada. The principal offices of the company are located at Toronto, Ontario.

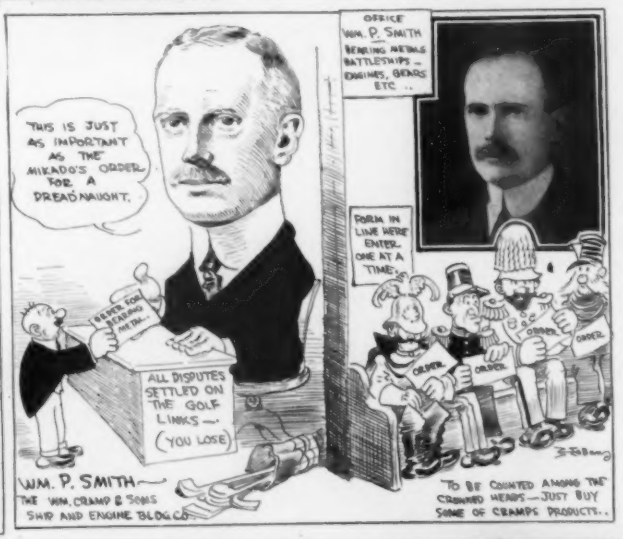
THE EUREKA NON SKID MANUFACTURING COMPANY, of 591 Bergen Street, Brooklyn, New York, advises us that it has recently received an order from a Russian house for twenty-two of its Non-Skids. This order was received on the strength of another order for a set of non-skids to the Commercial Cars, Ltd., of England, for use on a truck which was sent to Siberia and which took a gold medal in Russia.

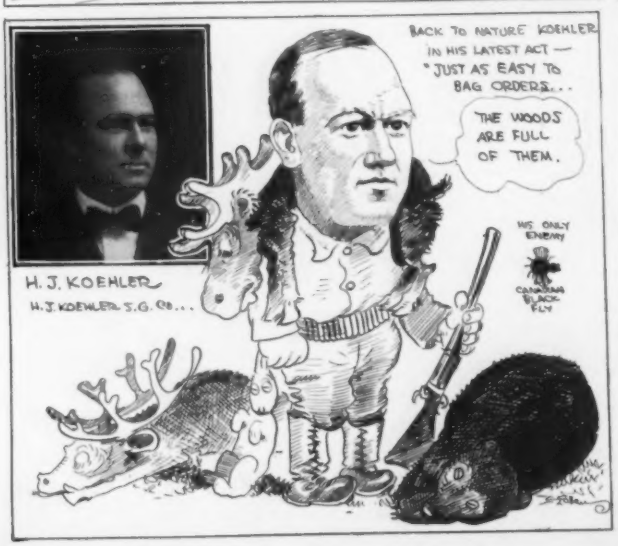
C C J GALLERY of SALES MANAGERS

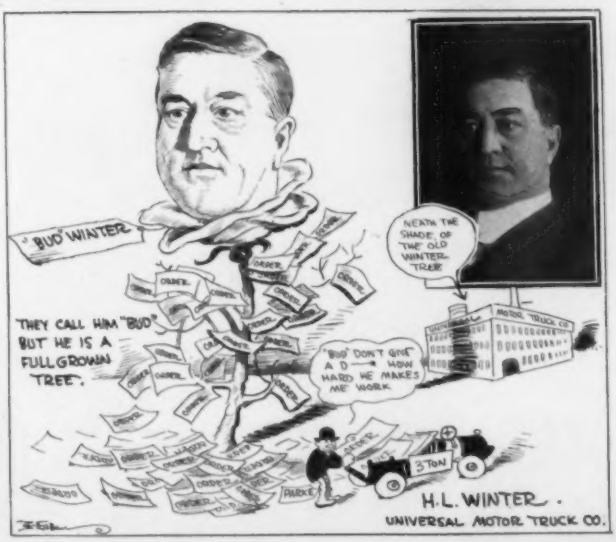
I'VE GOT THE EASIEST JOB IN THE FAMILY. YOU JUST WIND THESE UP AND THEY WIN A PENNANT EVERY TIME...
P.S. - ASK HIS SISTER.
D. C. HATHAWAY —
DAYTON AUTO TRUCK COMPANY.
5 TON
2 TON
3 TON
"DURABLE 'DAYTON" HATHAWAY...
THEY CAN'T COME TOO FAST FOR DICKEY HE HATHAWAY ABOUT HIM THAT SELLS TRUCKS..


H. F. L. FUNKE —
SARCO ENGINEERING CO....
THE AUTO WORLD
I'M THE GUY THAT PUT THE FUN IN FUNKE'.
WITH CRANKS HE CALLS THE "CONVENTRY" HE TURNS THE WORLD SO NONSELFISHLY.
SOME SALESMAN — THIS MAN FUNKE".


S. H. TAYLOR —
MERCHANT AND EVANS CO.
"GOING SOME" TAYLOR.
HAPPY THE MAN WHO HAS BEEN "SHOWN" AND CALLS THIS CLUTCH HIS VERY OWN...
POP HAS GOT TO "GO SOME" TO BUY SHOES FOR THIS BUNCH.
COMPETITION?
MELE-SHAW
100000 MARK


OFFICE
WM. P. SMITH —
BEARING METALS BATTLESHIPS — ENGINES, GEARS ETC...
THIS IS JUST AS IMPORTANT AS THE MIKADO'S ORDER FOR A DREADNAUGHT.
ALL DISPUTES SETTLED ON THE GOLF LINKS — (YOU LOSE)
FORM IN LINE HERE ENTER ONE AT A TIME.
ORDER
WM. P. SMITH —
THE WM. CRAMP & SONS SHIP AND ENGINE BLDG. CO.
"TO BE COUNTED AMONG THE CROWNED HEADS — JUST BUY SOME OF CRAMPS PRODUCTS.."


BACK TO NATURE KOEHLER IN HIS LATEST ACT — "JUST AS EASY TO BAG ORDERS...
THE WOODS ARE FULL OF THEM.
HIS ONLY ENEMY
CANADIAN BLACK FLY
H. J. KOEHLER
H. J. KOEHLER S. G. CO...


"BUD" WINTER
THEY CALL HIM "BUD" BUT HE IS A FULL GROWN TREE.
NEATH THE SHADE OF THE OLD WINTER TREE
"BUD" DON'T GIVE A D—— HOW HARD HE MAKES ME WORK.
ORDER
3 TON
H. L. WINTER.
UNIVERSAL MOTOR TRUCK CO.

COBURN MOTOR COMPANY, of Norfolk, Va., has taken the agency for the Alco truck.

LANDMAN-GRIFFITH COMPANY, Toledo, O., has taken the agency for the Gramm commercial line.

BORLAND-GRANNIS COMPANY, Chicago, Ill., is making arrangements to establish an agency in St. Louis, Mo.

KELLY-SPRINGFIELD MOTOR TRUCK COMPANY, Springfield, O., has opened a branch at South Grand Avenue, Los Angeles.

FORD MOTOR COMPANY, Detroit, Mich., has opened a factory branch in Columbus, O. P. F. Minnock, formerly Ford manager at Philadelphia, Pa., has charge.

FEDERAL TRUCK COMPANY, Detroit, Mich., has opened a branch store at Eleventh and Locust Streets, Kansas City, Mo., in charge of W. E. Dailey and G. D. Warriner.

RUMSEY ELECTRIC COMPANY, formerly located at 327 Jefferson Avenue, Detroit, Mich., has opened a garage for electrics on the Boulevard just east of Woodward Avenue.

VAN WINKLE MOTOR TRUCK COMPANY, Atlanta, Ga., has opened a city sales office at 39 Houston Street, and has secured the services of I. B. Lawton, formerly with the Buick Company, as sales manager.

HARTFORD ELECTRIC LIGHT COMPANY, Hartford, Conn., is occupying commercial garage just completed at rear of 1271 Main Street. The garage proper measures 50 x 250 ft., and is of concrete construction.

POPE-HARTFORD COMPANY, formerly located at 1714 Michigan Avenue, Chicago, Ill., has moved to 1840 Michigan Avenue. A service station has been installed, as well as a more extensive truck department.

AVERY MOTOR TRUCK COMPANY, Peoria, Ill., has arranged to open a branch for the selling of the Avery commercial cars at Salt Lake City, Utah. H. D. Landis, western representative of the Avery company, will probably have charge of the branch.

ILLINOIS AUTOMOBILE COMPANY, South Main Street, near Pico, Los Angeles, has the agency for F. A. L. cars and Krebs trucks. The local branch is under the direction of R. A. Wood, former manager of the Elmore agency.

MOTOR TRUCK CLUB, of New York, has established a permanent office at 1845 Broadway, and will engage in the collection and dissemination of truck information for the benefit of makers, dealers, owners and prospective buyers.

UNIVERSAL TRUCK COMPANY, of Philadelphia, which is handling the product of the Universal Truck Company, of Detroit, has built a large new building 217-221 N. 22nd Street, Philadelphia, for salesroom and service station for Universal trucks solely.

MUEHLING MOTOR CAR COMPANY has been organized in St. Louis, Mo., to handle trucks made by the Commercial Motors Company, of Jackson, Mich. Geo H. Muehling is president of the company; F. W. Muehling, vice-president, and Gustave Blumenthal is secretary.

CLAUDE M. NANKIVEL, 17 State Street, New York City, has been appointed foreign distributor for Stewart delivery trucks, manufactured by the Stewart Motor Corporation, of Buffalo, N. Y. Mr. Nankivel will handle the sale of these trucks in Europe, Australia, New Zealand, South Africa and South America.

PITTSBURG AUTOMOBILE SHOW ASSOCIATION, which has been formed by a number of Pittsburg automobile dealers and factory branches, is making great preparations for its show, March 1 to 8, 1913. It will be held in the Exposition Hall, which is amply large to hold all the exhibits of both pleasure and commercial cars. The main floor of the building is larger than Madison Square Garden, without a post or column to obstruct the view. Ninety per cent. of the exhibition space has already been allotted, although it is three months before the opening date of the show.

Automobile Shows at Which Commercial Cars Will Be Exhibited

January 4-11—Montreal, Can.
January 6-11—Cleveland, Ohio.
January 11-22—Brussels, Belgium.
January 20-25—New York City. Grand Central Palace and Madison Square Garden.
January 21-26—Toledo, Ohio.
January 22-25—Geneva, N. Y.
January 23-Feb. 1—St. John, N. B.—Local Armory.
January 25-Feb. 1—Providence, R. I.
January 27-Feb. 1—Philadelphia, Pa.
January 27-Feb. 1—Detroit, Mich.
January 27-Feb. 1—Scranton, Pa.
January 30-Feb. 1—Canadaigua, N. Y.
February 3-8—Fall River, Mass., Casino.
February 3-8—Washington, D. C. Convention Hall. Washington Auto Show Co.
February 8-15—Hartford, Conn. State Armory. Hartford Dealers' Association.
February 10-15—Chicago, Ill.
February 10-15—Minneapolis, Minn.
February 10-15—Ottawa, Can.
February 15-22—Albany, N. Y.
February 15-22—Newark, N. J. New Jersey Exhibition Company, First Regiment Armory.
February 16-23—Richmond, Va.
February 18-22—Baltimore, Md.
February 19-22—Topeka, Kansas, Auditorium.
February 22—Brooklyn, N. Y. Brooklyn Automobile Dealers' Association.
February 24-27—Kansas City, Mo.
February 24-March 1—Omaha, Neb.
February 24-March 1—St. Louis, Mo.
February 24-March 1—Memphis, Tenn.
February 24-March 1—New Orleans, La.
February 24-March 1—Paterson, N. J.
February 26-March 1—Glens Falls, N. Y.
February 26-March 1—Fort Dodge, Ia. Second Annual Northern Iowa Automobile Show. Fort Dodge Automobile Dealers' Association.
February 26-March 1—Glens Falls, N. Y.
March 3-5—Cincinnati, Ohio. Automobile Dealers' Association.
March 3-8—Pittsburgh, Pa.
March 8-April 2—Barcelona, Spain, International Automobile Exposition.
March 12-15—Ogdensburg, N. Y.
March 18-22—Syracuse, N. Y.
March 18-22—Buffalo, N. Y.
March 19-26—Boston, Mass. Mechanics' Building.
March 24-29—Indianapolis, Ind.
April—St. Petersburg, Russia. Fourth Annual International Auto Exhibition.
July—London, Eng. Olympia Hall. Industrial Vehicle Show.

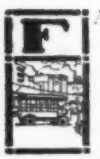
Carrying the Campaign Into the Prospect's Territory

Knowledge of Prospect's Business Necessary—The Right and Wrong Kind of Demonstration—Closing the Sales

BY E. S. FOLJAMBE

This is the fifth of a series of eight articles by Mr. E. S. Foljambe, dealing with subjects of interest to agents, dealers and manufacturers. Briefly, the subjects taken up are: Taking On a Commercial Car Agency; The Kind and Location of Salesroom; The Selection of and Instructions to Salesmen; Obtaining Prospects; Carrying the Campaign Into the Prospect's Territory; How the Engineering Force Can Assist the Retail Sales Department; The Agent's Responsibility After the Sale, and Relations Between the Agent and the Manufacturer. We are sure these will prove instructive and interesting reading.—EDITOR.

PART V.



AMILIARITY with the conditions of the various business houses in the territory is an essential to the salesman who really "makes good." Business is not, as a rule, knocking at your door; the live salesman gets out, and goes after it. To go after it intelligently means that he must know his prospect's business. This knowledge may be obtained in a large number of ways. Occasionally it has to be acquired without the knowledge of the business house itself, but usually and preferably it may be obtained with the sanction and co-operation of the officers of the company.

The agent sizes up a firm in a general way, knows that the work is such that trucks could be used unless there are unusual conditions not apparent on the surface. He then approaches members of the firm, the purchasing agent, or whoever is in authority. He states his proposition, and makes the assertion that he believes he can save the firm money by the introduction of trucks, or that the business can be extended or increased, or in other ways advanced, so that the introduction of trucks is advisable. As a rule, the members of the firm are all "from Missouri," they must be shown, and the agent or salesman then obtains permission to learn the methods practiced in the delivery department, or even existing conditions in the store itself, or in the manufacturing process, if the case is one where these directly affect the delivery problem.

Stand In With the Delivery Superintendent

Co-operation on the part of the delivery boss is very necessary. Without this the salesman will find it very difficult to learn the real state of affairs. He will be misled, or will not be allowed access to certain figures which are essential to a complete and all-embracing knowledge of the system. If demonstrations are made, the trucks will be hampered and many little things done which will prevent them from showing their best performance. Cases are known in which, owing to the opposition of the delivery foreman, even more strenuous ways have been adopted to make it impossible for the trucks to show what actually could be accomplished.

Hardly less important is the securing of the good-will of the drivers. The truck will be blocked by wagons, by bulky goods which must be removed, necessitating considerable loss of time; the loading will be unusually slow, and the same thing is true of the unloading. These are not conditions which exist in all places, but are very often met with, and must be recognized and prepared for by the wide-awake salesman.

The average man in charge of the delivery system is at once inclined to be antagonistic to anyone who proposes to re-arrange or suggest that anything can be done to improve the present system. The mere suggestion is taken as a personal impeachment. There are, however, a few broader minded and more liberally inclined traffic bosses, who realize that the introduction of motor trucks will eventually reorganize the delivery work, increase the sales, and be the ultimate means of creating for them a higher and better position; but unfortunately these are a very few.

Where it is necessary to obtain a certain amount of definite knowledge of the horse methods employed, and the actual cost of operation before the case is presented to the management, the co-operation of the drivers and the man in charge of the delivery is even more to be desired, for without it practically nothing can be done. Most business men are amenable to reason, and it is not necessary to go to any apparently underhand means of determining their present methods and costs.

Costs Unknown to Owners

There is, however, a condition which all too often exists, which greatly increases the labor of the salesman, namely the ignorance on the part of the firm as to the actual cost of delivery by the methods employed. The salesman usually finds that even where records are supposed to be accurately kept, many minor items which should legitimately belong to the cost of maintenance of the horses and wagons, are not added in, or appear on separate accounts. These items are sometimes sufficient to be the deciding feature as to whether motor trucks or horses shall be used. The problem then resolves itself for the salesman into one of gathering together, from the various scattered accounts and books, all items pertaining to the cost of delivery by the horse method, tabulating same and placing it in concrete form before the merchant. If this is impossible, an accurate estimate may be made from a general knowledge of horse delivery. These figures are often a surprise even to the officers of the firm who conscientiously believe that they knew what it was costing them for delivery. After showing the actual cost figures, the agent or salesman can then proceed to show what can be done with the commercial car. In most cases the purchaser desires a demonstration, which may be of anywhere from two to fourteen days duration. This at once brings us to the question of

STUDY the illustrations! They show how you can double the efficiency and profit of your heavy service truck.

The upper cut shows the "traction" wave always formed in the ordinary continuous tire under heavy load. This wave, caused by the bulging of the rubber, works into the base and tears the tire from its fastenings. It can't be avoided in any ordinary way. Then, too, this wave forms a constant hill—the tire is always climbing, retarding progress, reducing power efficiency.

Showing traction wave in ordinary continuous tire. (A) indicates where wave forms. (B) indicates base where roll and tread separation occur.

Contrast this condition with the profit-making worth of—

Firestone

Continuous Base—Notched Tread

Truck Tires

The lower cut shows how the Firestone Notched Tread overcomes the wave, by preventing its formation. This is *not* an individual block tire, with tread-tearing, metal-retaining plates. The Firestone continuous base is of the same tough, resilient compound as the tread. These tires hold the road, increase traction, absorb all vibration.

Get the full facts. They mean Economy and Increased Profits.

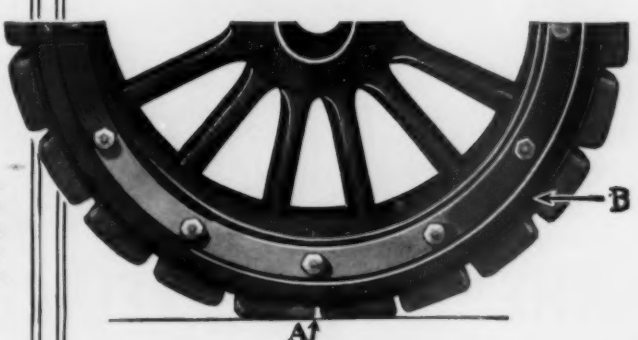
Firestone Truck Tires for Every Type of Car, Every Load, Every Road Condition

The Firestone Line of Truck Tires has in it the tire, solid or pneumatic, you need for your particular service. Get the books which tell the story. Ask, as well, for Quick Removable Rim facts. They are valuable.

The Firestone Tire & Rubber Co.

"America's Largest Exclusive Tire and Rim Makers"

Akron, Ohio—Service Stations Everywhere



Showing how Firestone Notched Tires overcome destructive traction wave. (A) indicates wave passing off into space between blocks. (B) indicates continuous base—assuring absorption of vibration in every direction.

Why 85% of City Deliveries Belong to the Electric

We have subways and elevated railroads and Electric locomotives where there are a lot of people. Don't we? The Electric Truck and Wagon are particularly adapted for city work. The bulk of trackless transportation is in the city.

About 85 per cent. of city trucking and deliveries calls for short hauls and frequent stops. In such work the Electric is fully 100 per cent. more efficient and economical than any other type of commercial vehicle. Because non-electrics are used in the field that belongs to the Electric, that doesn't right the economics of the matter. Don't forget **that!**

Business firms try out many types of machines, but their ledger eventually says in substance: "Here! Our present system is faster than horse service, but it costs too much to keep up. Our hauls are not long enough to get the greatest dividends out of cross country machines. Electrics have improved greatly and others are getting 300 days a year out of them for about half what we do with our service."

There are G. V. Trucks and Wagons which operate fully 50 per cent. cheaper in city work than other types. With current for a G. V. 1000 pound Wagon costing 52 cents a day, and the total depreciation and maintenance costs footing up to only $3.95 per day, how can you expect to equal this with anything **but** an Electric?

Catalogue 84 on request

THE GENERAL VEHICLE COMPANY, Inc.

Principal Office and Factory: LONG ISLAND CITY, NEW YORK

NEW YORK CHICAGO BOSTON PHILADELPHIA ST. LOUIS MINNEAPOLIS CINCINNATI

The Agent's Attitude Toward Demonstrations

Free and unlimited demonstrations have practically disappeared, all agents, dealers, branch houses, etc., recognizing that such long time demonstrations cannot be given unless paid for. The day is past when the merchant can have an unusual bill of goods carried free of charge one hundred miles or more under the guise of a demonstration. The custom varies greatly with respect to demonstrations, but as a rule only one or two days' demonstration is given free; after that a charge is made according to the size of the truck, length of haul, and character of the work. For instance, a demonstration of a four-ton truck covering a distance of from fifty to sixty miles, would cost $20. If the territory to be covered was as much as one hundred miles over poor roads, the charge might be $30. The pioneers in the introduction of demonstration charges frequently met with rebuffs, but the system is now well established, and any reputable business house is perfectly willing to pay a fair and legitimate price.

Most manufacturers now instruct their representatives to charge for demonstrations at a rate per day which will be about the average ton mile cost for hauling, as found by the experience of contractors or companies who do such work with motor driven vehicles for hire. This will do away entirely with the agent's shouldering the responsibility of delivering a large part of the goods of certain merchants for nothing. Rebating the price for the demonstration if the truck is purchased, is about the same as reducing the price, as it leaves the agent to pay the fixed charges incident to the use of the machine.

The Wrong and the Right Kind of Demonstration

Due either to lack of thought, or to over-enthusiasm, many salesmen make what might be termed the wrong kind of demonstration. By the wrong kind we mean any kind of demonstration which will give the prospective user an erroneous impression which will make him feel after he has purchased that the truck is not doing what he thought it would do; for example, it is but natural that after a demonstration has been arranged, the merchant desires to see the limit of what the truck can do. He has a special load to go to some particular place where the roads are bad, the hills high and usually steep. That is exactly the work he will ask to have the truck demonstrated upon. The driver, usually an employee of the agency, is probably an expert. He feels that it is up to him to make the very best possible showing. Result, he drives at a higher speed than the agent or anyone else would desire to have the truck driven every day in the year. He does not slow up for holes, car tracks, etc. as he would if not making a demonstration; in other words, he feels as if in a kind of race or competition, and operates the truck accordingly. His average speed is much beyond that recommended by the agent himself, who may be wise and conservative. The driver gets back an hour ahead of time, and thinks he has done something extremely creditable. The merchant is delighted, and naturally supposes that he can do the same thing every day in the year. There is also a tendency for not only the merchant but the demonstrator, to carry just as much as possible on a single load. The demonstration is therefore made very often with the truck overloaded anywhere from twenty-five to fifty per cent. This is an extremely bad example to set the prospective purchaser. His drivers and the delivery superintendent carefully note the performance, and all assume that this same thing can be done daily. A driver was once seen by the agent piling an enormous load on the truck. When asked what was the limit to which he could load the machine, he replied, "there ain't no limit, except I got to keep her so she'll go under the elevated." This is exactly the attitude of many horse drivers who are put on trucks after watching a wrong demonstration. They feel that they are no longer dealing with horses; there is an engine, and the truck seems to be so massively built there is no limit to what they can carry, except the height of the telegraph wires above the roadway. Any salesman or agent who permits a demonstrator to perform miracles with the truck on demonstration, is doing not only himself but the entire industry an injustice.

The Right Kind of Demonstration

The right kind of a demonstration is always a conservative performance. If anything, the truck is loaded slightly less than its full capacity; it is driven moderately, and in exactly the same way that the agent would desire the purchaser to use it day in and day out during the life of the machine. The conservative demonstration is very difficult to give, when competitors are giving the other kind, as by comparison the conservatively driven truck may appear to be inferior. This can usually be overcome by a heart to heart and intelligent talk on the part of the salesman with the most intelligent member of the firm, or man in charge. Fortunately, the limitations of iron, steel and rubber are gradually being forced home to the minds of the purchasing public, and it is not now as difficult a matter to bring the prospective purchaser to a realization of the fact that any machine can be overloaded, and that a machine as well as a horse must have periods of rest to insure long life.

Planning an Ideal Delivery System

One of the first things which has to be done by the salesman when asked what can be done in any specific case to use trucks, is the re-routing of the entire delivery territory. Probably no one former method has to be changed more than the arrangement of the routes. Unless the salesman has the co-operation of the foreman, this in itself will be a very difficult task, as it immediately upsets all the drivers and the entire system. Even with the assistance of those familiar with the work, it is sometimes difficult to reorganize routes satisfactorily, without a trial. The long routes in the case of installation of gasoline cars are naturally the first to be considered. Even entirely new sections are taken in, this perhaps being one of the chief reasons for the adoption of motor driven vehicles.

At this point it is sometimes found really necessary to change materially the delivery methods which have been in use for years. In order to allow the trucks to work to the best advantage, it is sometimes necessary to alter the doors, platforms, driveways, elevators, or in other ways provide means so that the trucks can load quickly. With some purchasers, a statement on the part of the salesman that these things are necessary, is received in the proper way, and the matter thoroughly investigated with a view to altering whatever is required to bring the system up to date, but with others the slightest suggestion that they will have to spend a dollar over and above the actual cost of the machines, is enough to "queer" the sale. If this is apparent, the salesman often religiously avoids any such suggestions, and allows the purchaser to install a truck with the hope that after a few months he will appreciate the necessity for such changes, and they can then be gradually made. This, it is acknowledged,

is bad, but the salesman hates to lose business, knowing that sooner or later the progressive business man will adopt trucks and somebody else will probably get the business.

Where an ideal system will be well received by the prospect, the salesman thoroughly plans one as far as is practicable, basing his arrangements upon the knowledge of the number of horses, the loads carried, the length of the routes, character of the territory, goods, etc. If his figures showing the cost of this method of delivery, as backed up by the demonstrations, appeal to the purchaser as correct, the order is usually his. Body details can be arranged, and the trucks start under favorable conditions.

As a rule, if the prospect has been convinced of the advantages of using the particular trucks in question, there is not much difficulty in obtaining the order, but it occasionally happens that it is almost necessary to hypnotize the purchaser before the signature is obtained. Again it is found advisable to bring pressure to bear on the prospect, and this is sometimes obtained from the engineering department. In our next issue the question of how the engineering force can assist the retail sales department, will be discussed.

(To be continued.)

DRIVERS MORE WILLING WITH TRUCKS

"All our drivers are teamsters," says G. U. Kierstead, of the City Coal Company, Hartford, Conn. The concern employs four trucks and a tractor. Speaking about drivers, Mr. Kierstead points out, "The driver who has been in the habit of operating a touring car does not like to soil his hands, and if he will not, it means an expense of from $600 to $700 a year more. If one of our drivers operates a car 75 miles a day we figure that he had done enough and ought not to do any of the loading or unloading. On the other hand, on the short runs the driver, by merely setting up the bags of coal for the carrying crew saves a lot of time. One man will carry in bags ten or twelve tons of coal a day so that when a car with four carriers aboard is considered, this is something of an item. Another feature of the carrier proposition is that on long hauls their efficiency is reduced because there is less work done in a given time."

Fred Kunkel, of Milwaukee, speaking on the driver situation, said that one of the first advantages he discovered was, that the men were quite willing to make a heavy trip if need be an hour before the close of the day's business. Contrasting with former conditions when he used horses Kunkel said, "If I had a lot of stuff that I wanted especially to get down to the railroad station I used to give the driver 25 or 50 cents and even then he was not willing. As he was paid $2.50 a day he received for that trip a good percentage. With truck service I can more easily plan things, and to plan things and then work them out as planned, has always been one of the hardest things I ever had to do."

Classified Advertisements

PATENT FOR SALE; SOMETHING NEW; AUTOMOBILE brake design for commercial cars; works automatically. Box 93, West Enfield, Maine.

WILL SELL A CONTROLLING INTEREST IN A COMpletely equipped motor truck plant now being operated at a profit and with established agencies and complete organization; the plant has been operated three years and has made steady progress; will require $50,000 capital, and will deal with principals only. Address H. Mart Smith, 525 Eggleston Ave., Cincinnati, O.

SPLITDORF

"Always There"

SPLITDORF PLUGS are not experimental—they are STANDARD.

SPLITDORF PLUGS will outlast your motor. There is nothing fanciful about them—they are made to endure any and every strain of ignition put upon them.

Gas-tight, soot-proof and unbreakable SPLITDORF PLUGS do not short-circuit or carbonize. For the hydro-carbon engine in automobile, aeroplane, motor truck, motor boat, motor cycle or farm tractor—for high pressure engine and terrific motor speed to a throttle down and barely revolving motor—SPLITDORF PLUGS are always reliable.

As with PLUGS so with MAGNETOS, COILS, SPLITDORFLITE lighting generator, and every ignition device—SPLITDORF claims are guaranteed.

Write for our New Catalog

SPLITDORF ELECTRICAL CO.

98 Warren Street, Newark, N. J.

BRANCHES:

New York, Boston, Philadelphia, London, Chicago, Detroit, Kansas City, San Francisco, Los Angeles, Seattle, Buenos Aires

If we were to offer to sell you gasoline at 10% less than anyone's lowest figure, would you buy?

Well we are doing that. All you have to do is to equip your car with one of these EGYPTIAN MIXERS and you save 10% on your gasoline bills. We guarantee this. You have **nothing** to lose and everything to gain. If you are paying 20c per gallon this means 2c saved on each gallon. Just figure what this means to you this year, and the next, and the next.

Order at once, costs only Three Dollars.

No working parts, nothing to change or alter. Slips in manifold above or ahead of carburetor. Installed in 15 minutes.

Is the new car you are going to get, equipped with this Guaranteed saver? Do some thinking!

Send size of carburetor and $3.00.

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110 North Fifth Street SPRINGFIELD, ILLINOIS

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You Can Forget Your Chains!

You'll have no use for them if your truck is equipped with

VICTOR BLOCK TIRES

They will keep deliveries going on schedule time. No lay-ups on account of tire troubles The simplicity of the fastening permits the removal of a block, right on the road in a few minutes. Simply take out two bolts, without even jacking up the wheel. Only tool required is a wrench.

Victor Are All-Year-Round Tires

They possess perfect traction and NON-SKID features, which are so essential for satisfactory winter service. They will not burn up on the hot streets and roads in summer. The independent block feature eliminates heat and allows for rubber displacement, thus insuring increased mileage. When you buy tires why not buy those that are practical for every season?

VICTOR Tires are OVERSIZE, having 15% broader wearing surface. This is an additional reason why VICTOR equipment means greater carrying capacity and the most effective service at the lowest cost per tonnage mile.

Fit any S. A. E. Standard Wheel. Write for booklet and prices

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MINNEAPOLIS—O. Fenstermacher, 311 South Fifth St.
PHILADELPHIA—Central Auto Supply Co., Broad St. and Ridge Ave.
ST. LOUIS—Schelp-Budke Tire & Rubber Co., 3454 Lindell Ave.
DETROIT—Akron-Detroit Rubber Co., 811 Woodward Ave
PITTSBURGH—J. G. Weir & Son, 1325 Liberty St.
CINCINNATI—The Bode Wagon Co., 1655 Central Ave.
DAYTON, O.—The Meeker Mfg. Co.

The New Water-Cooled KELLY Motor Trucks

K-30 Motor Truck in the Service of the Brehm Brewing Co., Philadelphia

Men Who Know Agree

that in our new 1 and 3 ton water-cooled models we score many decided advantages in design and general excellence of manufacture—undisputed advantages which appeal to the prospective purchaser who has learned, not from theory, but hard and practical experience. Some of America's leading motor truck and transportation engineers (those who have had opportunity of studying and testing our new water-cooled models) agree that they excel in their respective classes.

Experience has taught us that to build a big and permanent success for ourselves and our customers we must, first, build honestly and well, and, second, equip with service facilities at factory, at our branch depots and at our agencies throughout the country so that Kelly Motor Truck users may be assured, as nearly as possible, 100 per cent service satisfaction for many years after our product becomes their property.

The motor trucks you buy now must deliver high transportation efficiency for years to come. Make the right selection now. Get with the company that will stand with you, and for you, during the years that are to come. Don't experiment. Master your haulage problems now. Good equipment, backed by a good manufacturing company with complete service facilities, is the answer.

The New Water-Cooled KELLY Motor Trucks

Specifications

	1 TON (K-30)	3 TON (K-40)
Normal Load Rating	2000 lbs.	6000 lbs.
Price, f. o. b. Factory	$2000	$3400
H. P. Rating	28 h. p. at 1000 ft. piston speed	40 h. p. at 1000 ft. piston speed
Motor Suspension	3 Point	3 Point
Bore and Stroke	3¾x5¼	4½x6½
Type of Cylinder	L-Head	T-Head
Frame	4½″x3½″x7/32″	7′ x4′ x¼″
Casting of Cylinders	Bloc	Twin
Lubrication	Self-contained force-feed	Self-contained force-feed
Governor	Centrifugal Ball Type	Centrifugal Ball Type
Radiator	—Type	—Type
Ignition	Eisemann Auto,	Eisemann Auto
Clutch	Cone with Surface Springs	Cone with Surface Springs
Transmission	3 Forw'd & Rev.	3 Forw'd & Rev.
Control	Cent. Lever	Cent. Lever
Standard Wheel Base	120″	150″
Wheel Base Options	144″	130″ & 172″
Front Wheel Gauge	56″	68″
Rear Wheel Gauge	60″	72″
Size Front Tires	36x3½″	36x5″
Size Rear Tires	36x4″	42x5″ Dual
Chassis Length	15¼′	19½′
Chassis Weight with tires & driver's seat	3400 lbs.	6800 lbs.
Gasol'e Ta'k Capacity	15 Gallons	20 Gallons
Location Fuel Tank	Under Seat	Under Seat
Oil Tank Cap.—Gals.	2¼	2¾
Front & Rear Springs	Semi-elliptic	Semi-elliptic
Length Front Springs	40″	44″
Length Rear Springs	42″	56″
Size Service Brakes	16x2″	20x3″
Size Emerge'y Brakes	16x2″	20x2½″
Location Serv. "	Int. Exp. Rear Wheels	Int. Exp. Rear Wheels
Location Emerg. Brks.	Int. Exp. Rear Wheels	Int. Exp. Rear Wheels
Steering Control	Left	Left
Make of Axles	Kelly	Kelly
Axle Material (Front)	Carb. Steel	Carb. Steel

	1 TON (K-30)	3 TON (K-40)
Mat. of Steer. Knuck.	3½% nkl. steel	3½% nkl. steel
Ground Clear. Ft. Axle	10″	10″
Size Rear Axle	3x2″ I beam	4¼x3″ I beam
Axle Material (Rear)	Carbon	Carbon
Grd. Clear. rear sprock.	6″	6 1-2″
Norm. Rd. Sp'd—Miles	15 at 1000 feet piston speed	12 at 1000 feet piston speed
Length back of seat—standard frame	9′	12′3″
Length of spec. frames back of seat	12′	9′-15′-17′
Gear Ratios	8.63 to 1	11.69 to 1
Price stand. platform, exp. and stake bodies	$150.00	$200.00
Valve Sizes	1½″	1⅝″
Axle Bearings	Taper Roll.	Taper Roll.
Con. Rods, drive shaft and jack shafts	Chrome Vanadium	Chrome Vanadium
Piston Pin Bearings	1¼″x1 5-16″ diam.	1⅜″x1 17-32″
Pistons	3 3-4″ diam. 5 3-8″ long	4 1-2″ diam. 6 1-4″ long
F'ce width of trans. grs.	1″	1⅜″

K-30

Front Crank Shaft Bearing	Inside diam. 1¾″	Length 3″
Center " " "	" " 1¾″	" 3″
Rear " " "	" " 1¾″	" 4½″
Connecting Rod "	" " 1¾″	" 2 15-64″
Front Crank Shaft Bearings	2″x2⅞″	2″x3½″
Center " " "	1⅝″x2″	1 5-16″x2 7-15″
Rear " " "	1⅝″x2 5-16″	1 5-16″x2 7-16″

K-40

Front Crank Shaft Bearing	Inside Diam. 2⅜″	L'gth 3 25-32″
Center " " "	" " 2⅜″	" 3 25-32″
Rear " " "	" " 2⅜″	" 5⅜″
Connecting Rod "	" " 2⅛″	" 3 7-64″

Front Steering Knuckles, 3½″ Nickel; Crank Shaft 3½% Nickel; Transmission Shafts and Gears Nickel; Connecting Rods, Drive Shafts and Jack Shafts Chrome Vanadium. — Both Models

The Kelly-Springfield Motor Truck Company, Springfield, Ohio

Factory Branches—New York, Philadelphia, Boston, Baltimore, Kansas City, San Francisco, Los Angeles, Seattle, Birmingham

Do you want illustrations and specifications of your trucks before the eyes of

25,000

prospective buyers and dealers?

If you are in the HANDBOOK OF LATEST MODELS OF COMMERCIAL CARS made by America's Leading Manufacturers, you will be before the 25,000.

We are going to spend thousands of dollars to see that this book gets in the hands of the prospective buyer and dealer.

We published an editon of the HANDBOOK last year. It met with immediate success and copies were requested by thousands of prospective buyers and dealers. It appealed to them because it gave them just the information they wanted and was in compact form.

Why did it prove so popular?

Here is the answer:

Suppose you were a prospective buyer or dealer—the first thing you would want to know would be the names of all the truck manufacturers—

You will find them in the HANDBOOK

You would want to know the tonnage capacities of their trucks—

You will find them in the HANDBOOK

You would want to know the types of trucks suitable for your business—

You will find them in the HANDBOOK

You would want proofs that the commercial car is a good investment—

You will find them in the HANDBOOK

You would want tables of actual operating costs under various conditions—

You will find them in the HANDBOOK

These are some of the things the prospective buyer and dealer want to know and they are the men you want to know. Be represented there and

They will find YOU in the HANDBOOK

You will probably ask: "How can I get in the HANDBOOK?" We suggest that you write at once for information.

THE COMMERCIAL CAR JOURNAL PHILADELPHIA

For 3 Years

GIBNEY WIRELESS TIRES

SET THE PACE FOR ALL SOLID TIRE MAKERS IN AMERICA

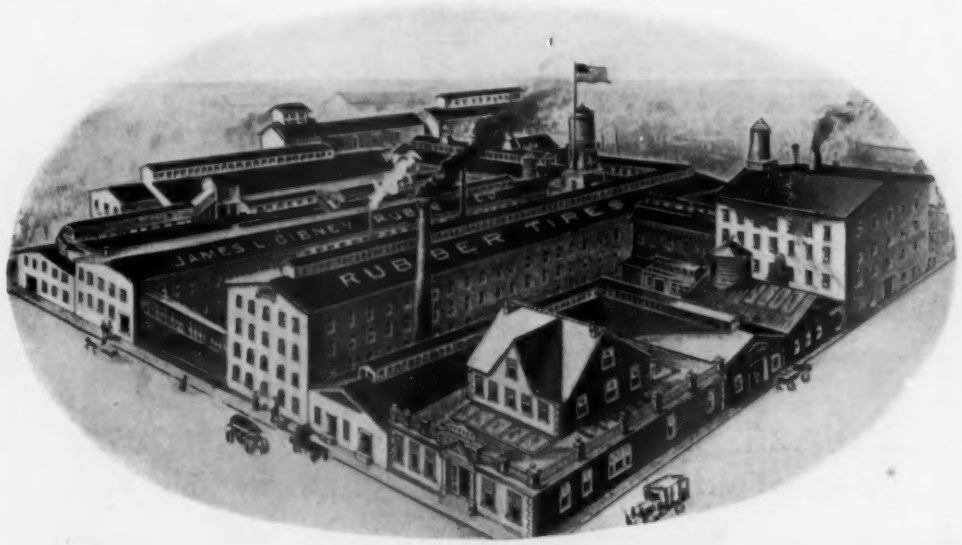
Today nearly all makers of solid tires are singing the praises of the Wireless Tire.

GIBNEY Wireless Tires are three years ahead. Can you afford to experiment when you don't have to take a chance?

We have had the experience and you get the benefit of that experience.

GIBNEY TIRE & RUBBER CO.

PHILADELPHIA **NEW YORK**



FACTORY: CONSHOHOCKEN, PA.

When Writing, Please Say—"Saw Your Ad. in the C. C. J."

POLACK TYRES

BRIDGEPORT, CONN.

POLACK TYRES

The New American Home of Polack Tyres

13,126 MILES

19,650 MILES

15,000 MILES

11,455 MILES

12,000 MILES

12,562 MILES

12,273 MILES

THREE YEARS

13,577 MILES

S. A. E. Standard Polack Tyres Added to European Standard

But No Demountable—The Decision Now

No longer at Jeanette — THE POLACK TYRE & RUBBER COMPANY announces that it is no longer manufacturing at Jeanette, Pa., and that the manufacture of the well-known POLACK TRUCK TYRE will hereafter be carried on in its own factory at Bridgeport, Conn., where greater facilities have been provided and the capacity largely increased.

Reputation abroad made good in America — That the POLACK TRUCK TYRE during its establishment on the American market has made good its reputation abroad needs no comment here—its mileages throughout the country bear testimony to the fact—

Success of Metal Base—Polack Feature — Also it is a gratifying reflection upon the uniform success of the Metal Base Construction which has been characteristic of the POLACK TYRE for over ten years, since it was first originated and adopted by the Parent Company in Germany, that most of the American tyre manufacturers have finally followed and adopted that construction.

S. A. E. Standard Sizes — AND NOW, IN ADDITION to the usual Metric sizes of European Standard, which vary in sectional height from 62 m/m (2½ inches) to 100 m/m (4 inches), the POLACK TRUCK TYRE is now made for the American market in the S. A. E. Standard Sizes, which are of a uniform thickness of 2¾ inches.

Demountable Excluded—and Why — While adding to the line of POLACK TYRES in America, the subject of the Demountable type received exhaustive study. Impartial investigation shows that the types of quick demountable tyres which are in the market at present have not proved as satisfactory in actual service as was expected, and until mechanical skill has progressed further in this direction, the Polack Company, pending further experiments, will confine itself to the production of the Pressed-on type of tyre exclusively, as it has done from its inception.

New Price-Lists

New Price-Lists have been issued and are available upon request

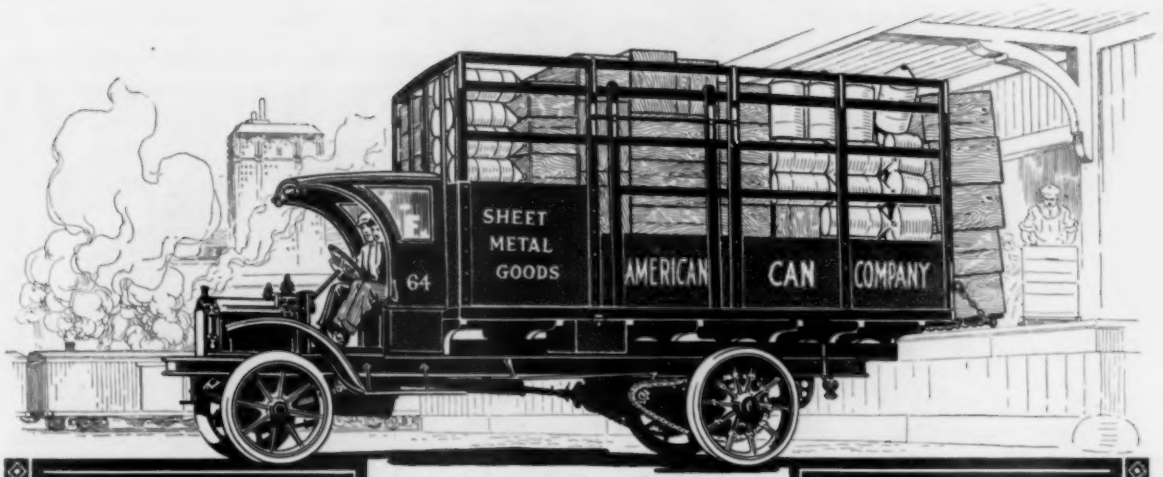
Your inquiries are invited

Polack Tyre & Rubber Company

Principal Offices: 246 West 59th Street, New York

BRANCHES AND SERVICE STATIONS:

Boston Chicago St. Louis Washington Philadelphia Kansas City Baltimore Detroit, etc.



White 5 ton truck. Can Co.'s White *One of the American Truck Squadron*

WHITE HEAVY SERVICE TRUCKS

Three and Five Tons

White Trucks for heavy service have proved to be more economical in the consumption of gasoline and oil than any truck of equal capacity.

Large steel wheels and a perfect load distribution make White Heavy Service Trucks the easiest to operate and the most economical in tire wear.

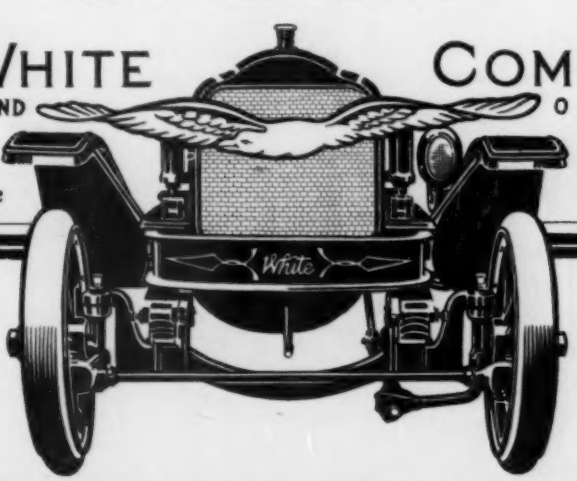
The name of White on a motor truck insures the lowest possible cost of upkeep and the longest and most continuous service.

White Trucks are also built in capacities of ¾ and 1½ tons, for lighter service

Detailed information furnished on request

THE WHITE COMPANY
CLEVELAND OHIO

Manufacturers of Gasoline *Motor Cars, Trucks, Taxicabs*



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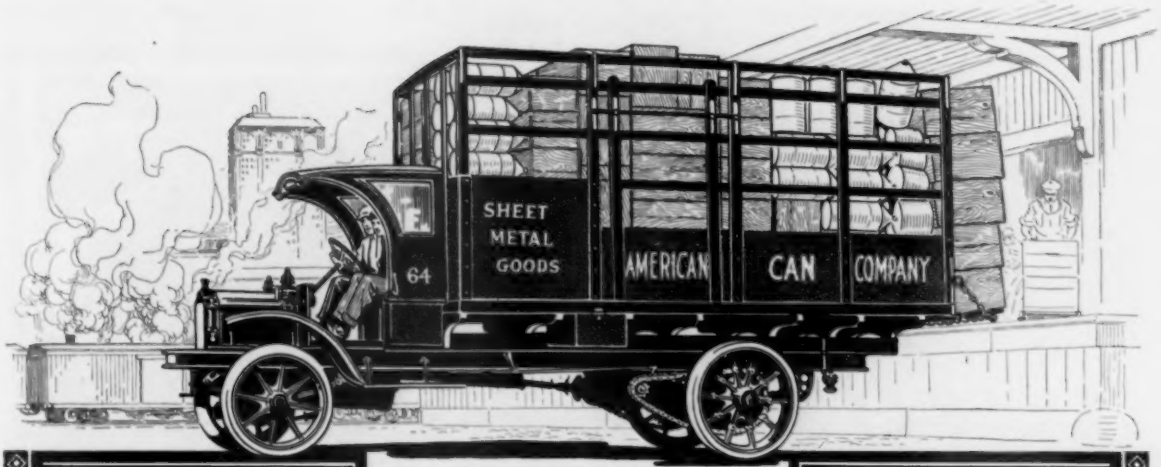

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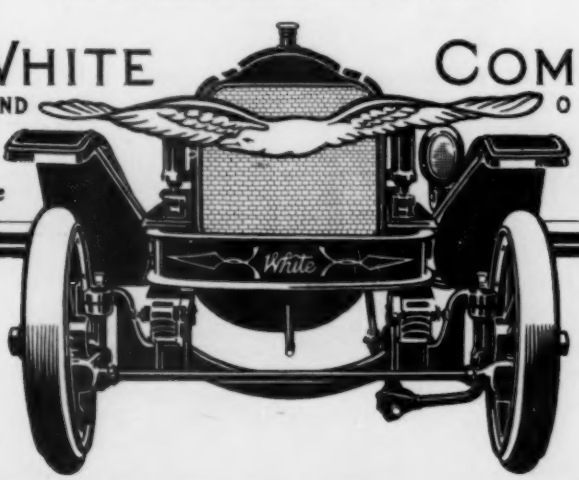

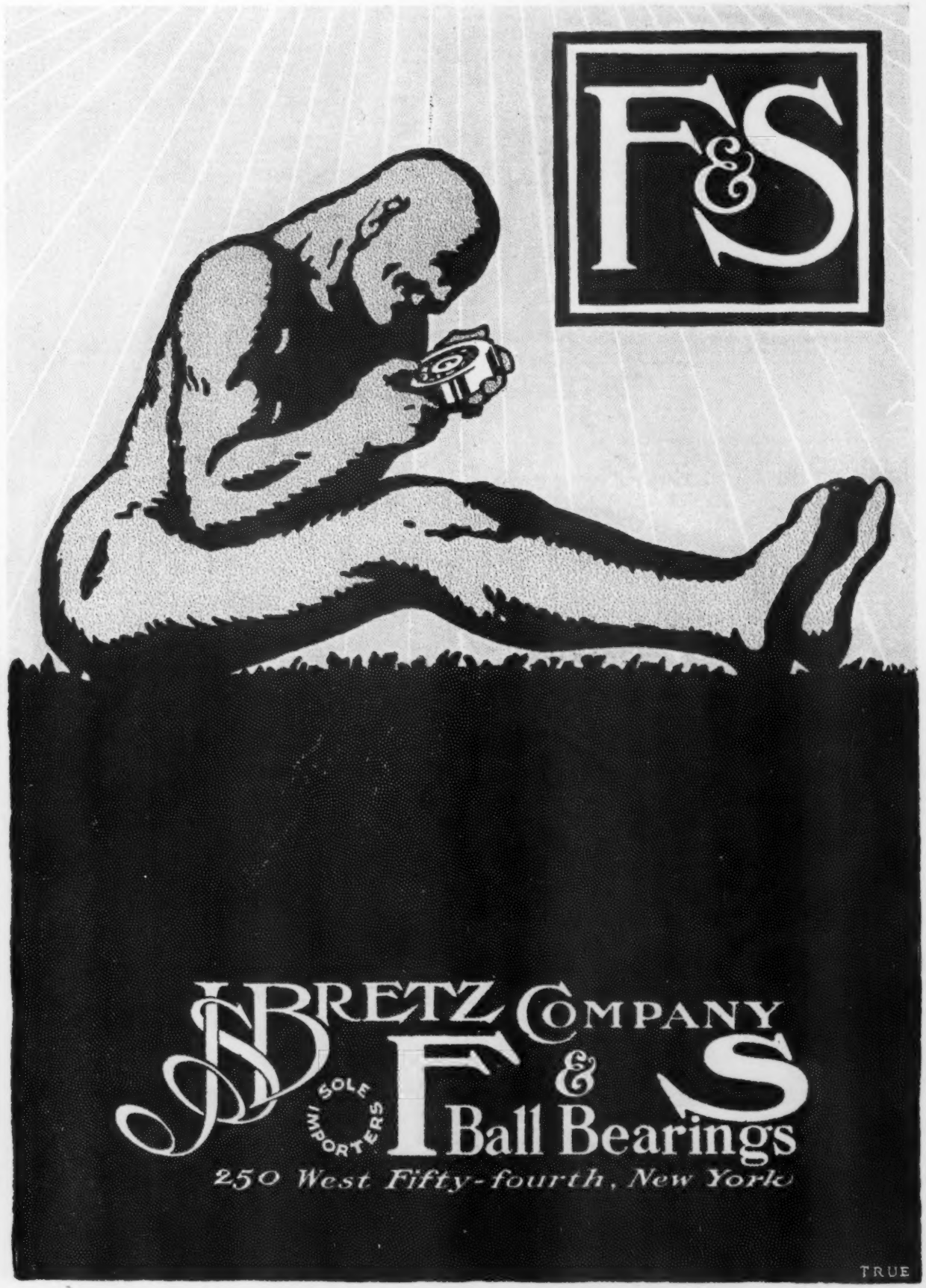
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F & S Ball Bearings
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Seamless Steel Tanks

for GASOLINE and AIR UNDER PRESSURE

in connection with Air Starter Equipments and Forced Gasoline Feed on Pleasure and Commercial Cars

All Sizes and Styles

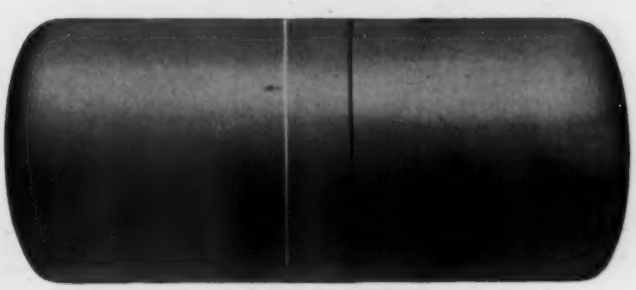
(in cylindrical shapes)

Light in weight, attractive in appearance, safer than welded or riveted containers of twice their weight. Send us your specifications.

We Are Manufacturers, Not Jobbers

Federal Pressed Steel Company

Milwaukee, Wis.



Two-Shell Banded Type

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Copies of the "Handbook of Latest Models Commercial Cars of Leading American Manufacturers"

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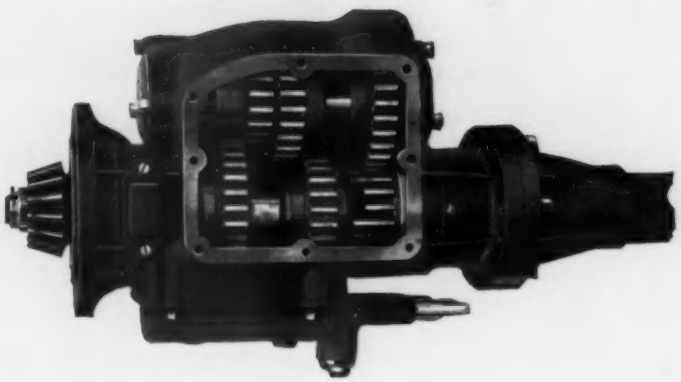

MANUFACTURERS

Who find their production cost uncomfortably close to their selling price,

Who desire to increase production without adding to present investment in plant and machinery,

Who desire to increase production without increasing their "Overhead" in salaries,

Who wish to overtake, or outrun their competitors by offering more real value for the money,

SHOULD include COVERT TRANSMISSIONS in the list of parts obtained from the manufacturers who specialize in one part of the car.

WRITE to-day, let us demonstrate the claims that we can, owing to specialization, long experience, and abundant facilities, coupled with cheap electric power, save you money, and increase your production and sales.

COVERT can do all of this, and at the same time make a fair profit—because a very large production of one line means a very small overhead per unit.

Covert Motor Vehicle Company

Factory: Lockport, N. Y.

Sales Office: 1422 Ford Building, Detroit, Mich.

Send for this book

Cramp's Gear Bronzes for Rear Axle Drive

THE modern up-to-date drive for both touring cars and trucks is a steel worm and a bronze worm wheel. Our gear metals long ago passed the experimental stage. We have been manufacturing worm drives for nearly 100 years for all kinds of machinery from turret turning gear to lifting bridges, elevators, marine railways, etc., and we are now furnishing our worm gearing for automobiles.

Our metals will better resist wear and abrasion, have longer life and higher efficiency than any other gearing metals and have the great strength necessary to resist heavy starting torque. They are designed to withstand excessive strain and shock and this strength is given to them without impairing their wearing and antifrictional qualities.

There is no need of importing bronze wheels for worm drives

We manufacture better material and you save DUTY, FREIGHT and TIME

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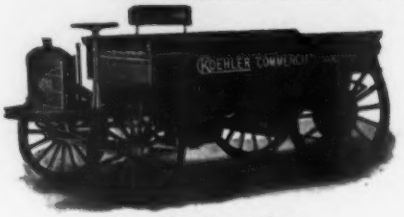
The William Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.

KOEHLER COMMERCIAL CAR

CARRYING CAPACITY 1600 LBS. $ PRICE 750.

The Maximum Car at Minimum Price



Open Flare-Board Type

Large and roomy. Inside measurements, 44 inches wide, 84 inches back of driver's seat to rear. Flare-boards, 17 inches above floor. Strongly ironed throughout, also ironed to receive four-post canvas top, which can be had from stock at $40 additional. **Capacity,** 1600 lbs. **Price.** $750. Prices of various types of bodies range from $40 to $150 extra.

All styles of bodies are obtainable. **KOEHLER** is built in Newark, N. J. and is backed by an organization of integrity and capital.

ADDRESS ALL CORRESPONDENCE TO

H. J. KOEHLER S. G. CO.

1709 Broadway, New York, N. Y.

TRAVELOG

Is your truck investment paying you?

You have invested your good money in truck equipment and it is up to you to see that it is making good.

There is only one way of *knowing.*

The TRAVELOG registers its every move. It tells you how many stops were made, the duration of each stop and the time length of each run.

See that your truck is kept moving and make that investment earn money for you.

Write at once for details

W. H. BROWN, ROSE BLDG., CLEVELAND, OHIO

MERCURY TRUCKS

1000 lbs. Capacity

The result of 10 years' experience proves it not an experiment.

You may as well buy now.

Our product is standard, changes are unnecessary, and there will be no yearly models.

Manufacturers not assemblers.

The Mercury Manufacturing Company

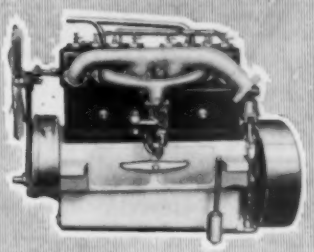
4106 S. Halsted Street, Chicago, Illinois

MAKE your guarantee of truck efficiency mean what it says. The truck equipped with the Waukesha Long-Stroke Truck Motor fulfills every promise your guarantee makes—because it's a motor with unlimited capacity for hard work—because its strength combats abuse and carelessness and keeps down the upkeep expense to the minimum—because it consumes less fuel than any other motor, and because it's strictly a truck motor.

The Waukesha possesses strength to a most unusual degree. The crankshaft is of double-heat treated nickel chrome steel, with tensile strength of 70 tons. That metal is exclusively our own process. So, too, is the metal from which the Waukesha

WAUKESHA

4¼×6¾" Long Stroke Truck Motor



bearings are made—they have greater resistance than Parson's White Brass. The construction of the motor as a whole has the comparative strength of these two parts.

The truth regarding the Waukesha Motor makes fascinating reading for the truck manufacturer. Ask us!

WAUKESHA MOTOR CO., Dept. A, Waukesha, Wisconsin

The "MODERN" Truck Will Strike You Just Right!

It's built right. The stuff is in it—both material and brains—minus all fuss and jim-cracks. A practical car for the practical buyer—the man who likes to get heaping-over measure for his money.

The closer you investigate it the better chance the "MODERN" has of landing in your delivery garage.

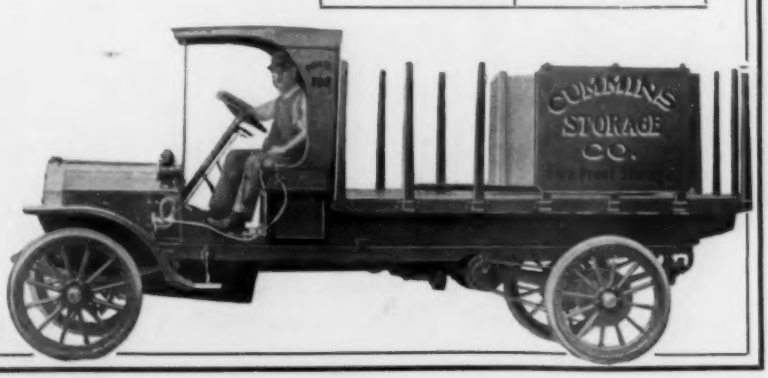
MR. DEALER: An agency for the "MODERN" not only makes selling easy, but it brings you prestige. The "MODERN" is a live proposition for a live agent. Write today for some interesting facts we have to present to men who are in a position to sell trucks. And you men who are not selling trucks, we've got something to say to you. We say it in a way that grips and the illustrations that go with the talk will make you sit up. Write today.

The Bowling Green Motor Car Company

Dept. A

Bowling Green, Ohio

SEE IT AT THE NEW YORK SHOW	SEE IT AT THE CHICAGO SHOW
Jan. 20th to 25th, 1913	Feb. 10th to 15th, 1913



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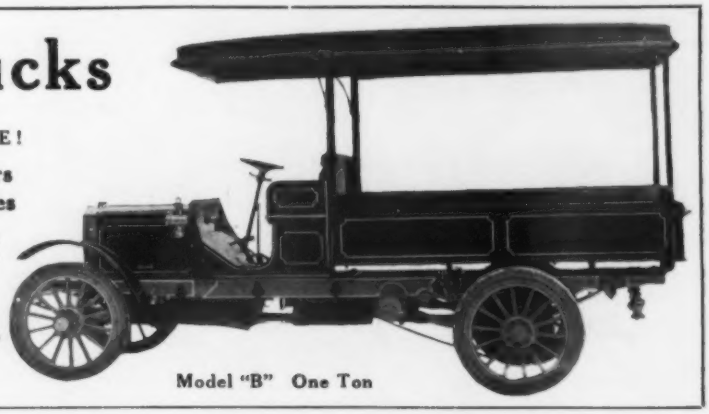
DELIVER THE GOODS!
THE PERFECTLY BALANCED MACHINE!

Gasoline and Electric Delivery Cars
Motor Trucks Hotel Omnibuses

Write for catalog and details. We are pioneers and can supply any size or type for your purpose.

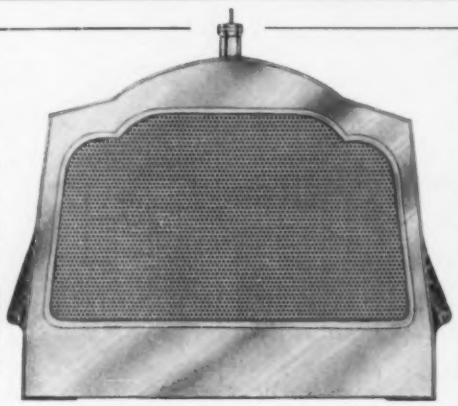
Atterbury Motor Car Co.
BUFFALO, N. Y.



Model "B" One Ton

FEDDERS
Real Square Tube Radiators

¶ Commercial cars require radiators that will stand many shocks and much hard usage. This was one of the weak parts of the commercial car but the test of time has proved that FEDDERS radiators render efficient service.



¶ We want to figure with you your requirements for the coming season. If you haven't used Fedders radiators you probably have had a great deal of radiator trouble and you may think that there isn't a radiator built that will give you satisfaction. If this is the case we would like to have an opportunity of demonstrating that the Fedders radiator will stand the wear and tear and shocks of the commercial car and that manufacturers who equip their commercial cars with the Fedders have practically no radiator trouble. We can convince you. Will you give us the opportunity?

FEDDERS MFG. WORKS
BUFFALO :: NEW YORK

SEAMLESS MOTOR TRUCK GASOLINE TANKS

LEAKLESS

STRONG AND STURDY FOR ROUGH SERVICE
ALL SIZES IN STOCK

AIR PRESSURE RESERVOIRS FOR
SELF-STARTERS AND GARAGE TIRE FILLERS

New Catalog Now Ready—Write Us

COMPRESSED AIR MOTOR TRUCK STARTERS COMPLETE

The Commercial Car Journal

is the logical paper for every man to read who contemplates buying or selling commercial motor cars.

It is brimful of essential information.

The Commercial Car Owner will also find many suggestions in it that will make his driving more efficient.

Send for a sample copy

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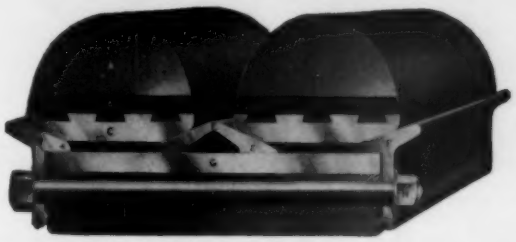
Market & 49th Sts., Philadelphia, Pa.

The
United States Standard Motor Truck Tire
(Demountable)



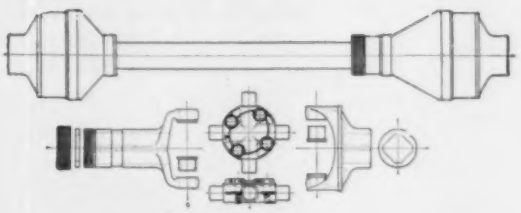
has established standards of tire economy never before known.

No more delays while tire replacements are being made. Changes can be made by the driver **anywhere** in fifteen minutes' time or less.

Guaranteed for 10,000 miles if used in one year.

Write us for descriptive literature.

United States Tire Company
New York



P-30 Drive

We supply single universals or drive shafts complete as shown. Forgings are special analysis steel, heat treated, machine work accurately done. Note extreme simplicity of design, insuring long life.

The Otto Konigslow Mfg. Co.
CLEVELAND
Sixth City
Sales Agents: THE ZINKE CO., Chicago

Agents Attention

You have no doubt been trying to make up your mind as to what line of motor trucks will make you the best proposition for 1913. If you are not posted on the ADAMS—write us at once for details. Increased production will enable us to take on a few more good agents in unassigned territory.

Adams Trucks
"Deliver the Goods"

In writing, state facilities for handling the business, as well as territory desired.

THE ADAMS BROS. CO.
FINDLAY, OHIO

PRESSED STEEL
FRAMES
FOR TRUCKS

Handsome, Light, and more enduring than those made of rolled channel

A. O. SMITH COMPANY
MILWAUKEE

BUCKEYE Motor Truck Jacks

Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¼″	6⅛″	18″	16 lbs.	2½ tons	with formed handle	$10.00
13	14¼″	7⅛″	20⅜″	26¼ "	3 "		15.00
14	14¼″	7⅛″	20⅜″	33 "	5 "		16.00
9	11⅛″	6″	17½″	10 "	1½ "		6.00

Write today for descriptive catalog. Made only by

THE BUCKEYE JACK MFG. CO., Alliance, Ohio

New Departure Ball Bearings

SIGNIFY

Guaranteed Materials
Guaranteed Accuracy of Dimension
Guaranteed Uniformity

No ball bearing is so carefully made, closely gauged, persistently inspected and insistently standardized.

Catalog, data sheets, consultation service of our Engineering Department are yours for the asking

Guaranteed Quality
Guaranteed Service and Capacity
Guaranteed Durability

American Made *for* American Trade

The New Departure Mfg. Co.
BRISTOL, CONN.
Western Branch, 1016-17 Ford Building, Detroit

American Made *for* American Trade

BOLLEE LAUTH-JUERGENS RANDOLPH SEAGRAVE KISSEL GRAND RAPIDS SCHNEIDER KINNEAR PEERLESS RENAULT

ADLERWERKE

BALL BEARINGS

"INSURANCE FOR BUILDER AND USER"
RHINELAND MACHINE WORKS CO
140 WEST 42nd ST. NEW YORK, N.Y.

HISPANO-SUIZA

GEBRUDER STOEWER ARIES KELLY NAGANT PANHARD PEUGEOT DELAHAYE MACK DE DIETRICH AUTO-METALLURGIQUE

WESTON MOTT CO.
FLINT, MICH.

AXLES, HUBS, RIMS

OF HIGHEST QUALITY

Strength and durability are factors of the utmost importance and our products are made to meet the severest tests.

In the year 1913

More Remy Magnetos

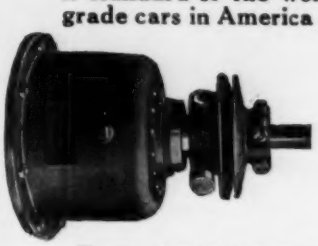
will be used on American Cars **THAN ALL OTHERS COMBINED.** We are the world's largest manufacturers of Magnetos, Electric Lighting and Starting Equipment for Motor Vehicles.

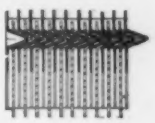
Standardize Your Car
Specify Remy

Remy Electric Company
Factory **General Offices**
Anderson, Indiana

Branches and Service Stations in Automobile Centers

THE *EVANS'* MODEL
"HELE-SHAW" CLUTCH
(Patented)
is standard of the world on high-grade cars in America and Europe





Cross section of plate grooves

The cut shows details of wedge-shaped annular grooved plates used in "Hele-Shaw" Clutch. They combine the best of the cone and disc principles.

The "Hele-Shaw" Clutch has a grip like a vise, but is slippable indefinitely, giving the car a capability of speed *ranging from a creep* to its full power.

The "Hele-Shaw" Clutch is absolutely self-contained and removable as a whole at any time.

Pressed Steel Case

In use on over 100,000 cars of over 250 makes.

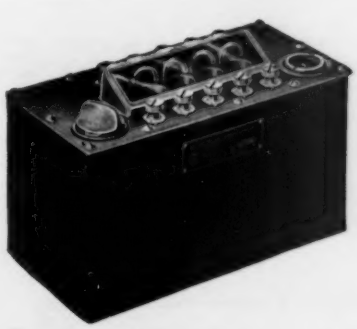
Send for catalogue No. 7 giving bore, stroke and number of cylinders.

SEE US AT NEW YORK AND CHICAGO SHOWS

MERCHANT & EVANS COMPANY
The Premier Metal House in America
PHILADELPHIA

M & E

New York Brooklyn Chicago Kansas City
Baltimore Wheeling Cleveland Denver



Detroit Oilers have no ball checks

There are no check valves or other complicated parts in Detroit Mechanical Force Feed Oilers to give trouble and cause failures. Every drop of oil **must** go to the place where it is needed.

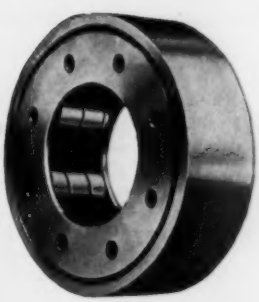
A separate pump for each feed measures the oil and insures a rate of feed that is **exactly** right at all times. Once properly regulated there is no chance for faulty lubrication and dry bearings, carbonized cylinders, smoke at the exhaust and wasted oil are entirely eliminated.

Detroit Oilers are made with from one to thirty feeds in capacities of two pints to five gallons—pulley, sprocket, ratchet or gear drive.

Made also with two compartments for feeding one kind of oil to cylinders and another to the bearings.

Write today for catalog P-67 and full information.

DETROIT LUBRICATOR COMPANY.
DETROIT, U. S. A.
Largest Manufacturers of Lubricating Devices in the World.



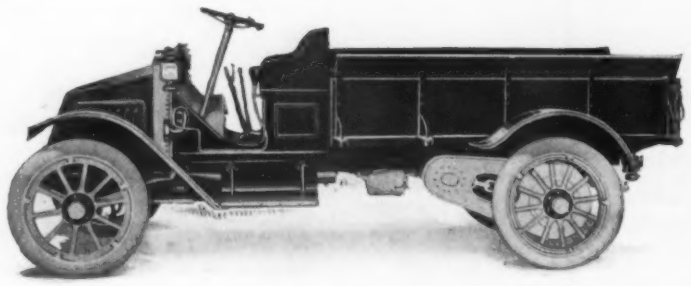
FLEXIBILITY SAVES THE GEARS

SHOCK LOADS IN MOTOR CARS are enormous. Even ordinary speeds on average roads produce vibrations which would make any riding impossible without the use of springs, absorbers, etc.

NO PRINCIPAL MEMBER of the motor car even approaches a condition of absolute rigidity. An automobile bearing, then, whose successful operation depends upon accurate alignment of frame and shafts cannot give its best service under these conditions.

MIGHTY LITTLE FLEXIBILITY is in a solid ball or roller. The one bearing in which it really exists is the Hyatt. There the spiral rolls carry gears in accurate mesh under service conditions, at the same time cushioning shocks and relieving surrounding parts of excessive strains and stress.

Hyatt Roller Bearing Company
DETROIT, MICHIGAN



"Sandusky" Model "B" 1500 lb. Delivery Truck

Long stroke, 4-cylinder motor, 30 H. P.
Selective sliding gear transmission.
120 inch wheelbase.
Double chain drive.
Chains enclosed in aluminum cases.
Center control, left-hand steering.

PRICES:

Chassis - - - -	$1400.00
Chassis with Express Body -	1475.00
Chassis with Covered Delivery Body	1500.00

DEALERS:—Write for agency proposition. Do it now. It is the best buy in the world today.

Sandusky Auto Parts & Motor Truck Co.
Sandusky, Ohio, U. S. A.

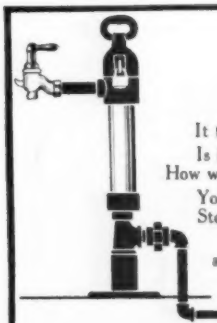
THE W. F. STEWART CO.

ESTABLISHED 1881 INCORPORATED 1898

FLINT, MICHIGAN

WE BUILD BODIES

for both pleasure and commercial vehicles, and can give you goods and service that can be depended on. The price, too, will be right. Get in touch with us.



Ordinary Gasolene Boils at 113° F.

It throws off power-producing vapor at 60°. Doesn't it get that hot almost any day?

Is it any wonder that your truck "acts up" when you feed it gasolene out of a wooden barrel "faucet" or "jigger pump" tin can? How would your horses have acted if you had fed them cobs instead of corn? Do you think you would have gotten results?

You bought trucks because of their economy. Why not increase their economy still more by using a Bowser Underground Safe Storage System?

There is a system to fit your needs in size and price, crated and packed ready for installation. Let us tell you something about them. Send for Book No. 11.

S. F. BOWSER & CO., Inc., HOME PLANT AND GENERAL OFFICES FORT WAYNE, INDIANA

BRANCHES:—New York, Chicago, Minneapolis, St. Louis, Dallas, Atlanta, San Francisco, Denver, Toronto

Patentees and manufacturers of standard, self-measuring, hand and power-driven pumps, large and small tanks, gasolene and oil-storage systems, self-registering pipe-line measures, oil filtration and circulating systems, dry cleaning systems, etc. Established 1885.

THE KINSEY MANUFACTURING CO.

TOLEDO, OHIO

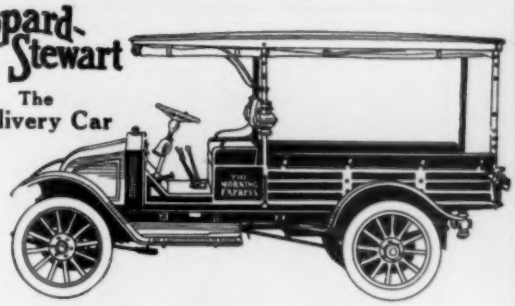
Manufacturers of Auto Parts—

Kinwood Radiators, Fenders
Kinwood Oilers, Gaskets
Kinwood Steel Frames, etc., etc.

SPECIAL METAL STAMPINGS

Lippard-Stewart

The Delivery Car



Lippard-Stewart Cars

Guarantee Prompt, Efficient and Economical Delivery

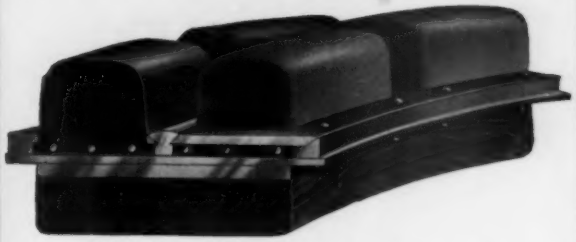
Lippard-Stewart Delivery Cars give service because they are built to give it. They assure quick and dependable delivery over a wide territory at the minimum cost per package, because they are constructed by engineers who know and have fulfilled every requirement demanded of a thoroughly efficient delivery vehicle.

Read These Special Features of Lippard-Stewart Construction

Continental 30 H. P. Motor — Timken Roller Bearings Throughout
Eisemann Magneto — Special Spring Suspension
Brown-Lipe Selective Transmission — Left-hand Drive
Cone Clutch — Every Part Easy of Access
Full Floating Timken Rear Axle — Tires—35 x 4½ Front and Rear

Lippard-Stewart Motor Car Co., Buffalo, N.Y.

August Becker, Pres. E. J. Barcalo, Treas. J. C. Millar, Sec'y
C. S. Dahlquist, Chief Eng. W. F. Reynolds, Sales Mgr.



A Great Non-Skid Tire For Heavy Trucks

Here's a tire of wonderful traction power—a tire of giant endurance—a tire that makes you utterly independent of all tire-applying stations.

THE GOODYEAR
AKRON, OHIO

Individual Block Tire

The great advantage of this tire over common block tires is its *individual* fastening. Instead of one plate or fastening holding in place *several blocks*, each block has its *own separate fastening*.

As a result, a perfect adjustment of each block is possible at all times. Time is saved. The tires last.

Seven Truck Tires. Each of the 7 Goodyear Truck Tires has *some* time and money-saving device just as important as the *Individual Block* —some exclusive feature that our experts have invented, that you might have a more lasting and perfect *tire service*. All described in our booklet on "Truck Tires." Sent on request. Address

The Goodyear Tire & Rubber Co., Akron, Ohio

Branches and Agencies in 103 Principal Cities

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits
Main Canadian Office, Toronto, Ont. Canadian Factory, Bowmanville, Ont.

Money to Burn

Gasoline is increasing in price. Its cost is a great consideration. The running of engines while cars are standing idle is waste. Fuel so consumed shows you have money to burn.

If You Don't Want to Burn it

Remember the

"DISCO"

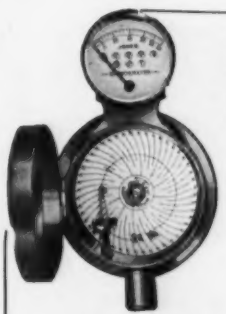
SELF-STARTER

will help you cut out this leak. No driver will hesitate to stop his engine if he does not have to crank it.

Mr. Car Owner: Write us for printed matter, and let us show you how to cut down running expenses.

Mr. Car Maker: Equip your engine with the Disco Self-Starter and increase your sales by proving economy.

Ignition Starter Company
708 Dodge Building Detroit, Mich.



Does Your Driver Loaf On The Job?

Motor Truck Drivers are human. They'll take an hour here and there if they can. They will waste your time and money when making deliveries.

JONES RECORDER

Keeps the Driver on the Job

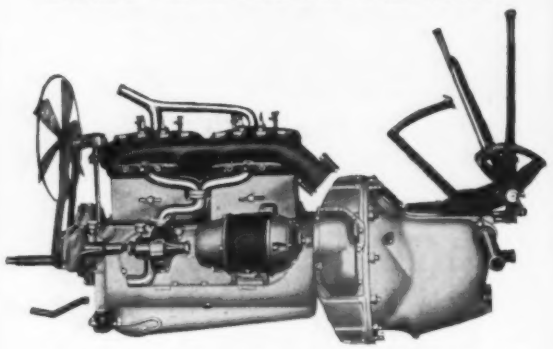
It gives you an accurate report of every movement of your truck or delivery wagon. It tells how fast and how far, the number of stops, duration of each and when driver left and returned to garage.

Write for Particulars

THE JONES RECORDER

Broadway and 76th Street, New York

HAZARD
UNIT POWER PLANT



Motor, Clutch, Transmission and Gear Shift Control all in One Compact Outfit.

Center Control, Three Point Suspension, Oil Tight, Dirt Proof.

Gear Reduction Integral with Unit Power Plant permits straight line shaft drive to live rear axle. Automatic inclosed Governor.

No Time Limit to Our Guarantee.
Full Descriptive Catalog on Request.

HAZARD MOTOR MFG. CO.
841 Coates Street, ROCHESTER, N. Y.

Ford
THE UNIVERSAL CAR

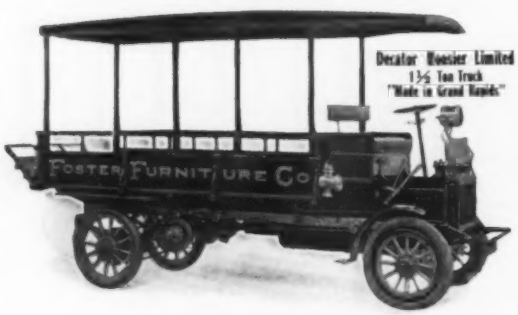
Compare! Compare! Compare! It is not what we say about the swift and silent Ford that makes it a great car. It is what the Ford has done—and is doing—that makes it "the universal car"—Compare! Compare! Compare!

Every third car a Ford—and every Ford user a Ford "booster". New prices—runabout $525—touring car $600—delivery car $625—town car $800—with all equipment, f. o. b. Detroit. Get particulars from Ford Motor Company, Detroit, Mich.

Decatur 1½ Ton Truck

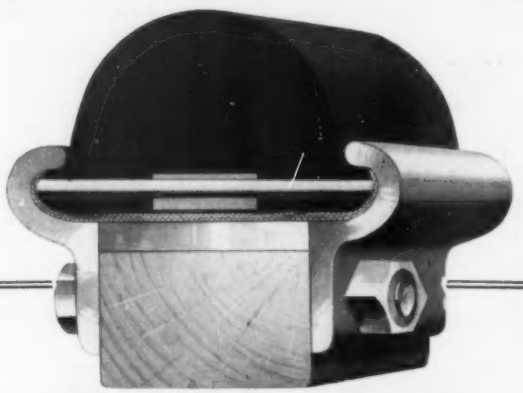
The Truck with a reputation for

Economy Efficiency Durability
and Low Operating Cost



Our Trucks are used in 61 different lines of business. Write for catalog and complete specifications telling WHY DECATUR TRUCKS ARE BEST.

Grand Rapids Motor Truck Co.
Grand Rapids, Michigan



REPUBLIC MOTOR TRUCK TIRES

Just as a chain is no stronger than its weakest link, so a truck is no more efficient than its tires. Republic Motor Truck Tires will increase the efficiency of your trucks by keeping them on the road day after day, by cutting down the cost of maintenance. Let us show you in dollars and cents.

THE REPUBLIC RUBBER CO., Youngstown, Ohio

These Branches and Agencies will supply you with truck tires and truck tire service:

Albany, N. Y.—Albany Vulcanizing Works
Atlanta, Ga.—The Republic Rubber Co., 237 Peachtree St.
Boston, Mass.—The Republic Rubber Co., 735 Boylston St.
Buffalo, N. Y.—The Bison Rubber Co.
Chicago, Ill.—The Republic Rubber Co., 1732 Michigan Ave.
Cleveland, Ohio—The Way-Mitchell-Rigdon Co., 5919 Euclid Ave.
Dallas, Texas — Slaughter-Randal Co., 2033 Commerce St.
Denver, Colo.—The W. C. Hendrie Rubber Co., 1238 Broadway
Detroit, Mich.—Republic Rubber Co. of Mich., 1001 Woodward
Kansas City, Mo.—Bart S. Adams, 1513 Grand Ave.
Los Angeles, Cal.—Republic Tire & Rubber Co., 1227 S. Olive St.
Minneapolis, Minn.—The Republic Rubber Co., 1514 Hennepin Ave.
New York, N. Y.—The Republic Rubber Co., 229 West 58th St.
Philadelphia, Pa.—The Lyman Tire & Rubber Co., 328 N. Broad St.
Pittsburgh, Pa.—Lange Motor Truck Co., S. St. Clair and Eva Sts.
Rochester, N. Y.—Rochester Auto & Supply Co., 352 Main St., East
Salt Lake City—The W. C. Hendrie Rubber Co., 210 S. W. Tempie
San Francisco, Cal.—Republic Rubber Co. of Cal., Golden Gate Av. & Hyde St.
Seattle, Wash.—Republic Tire Co., 1425 Broadway
Spokane, Wash.—Interstate Rubber Co., 417 First Ave.
St. Louis, Mo.—The Republic Rubber Co., 1215 North Broadway
St. Paul, Minn.—The Republic Rubber Co., 76 West 7th St.
Washington, D. C.—J. M. Doyle, 320-2 Pennsylvania Ave.

The worm gear drive of Pierce-Arrow Trucks delivers more of the generated power to the rear wheels than is possible by any other means, because it is the most *direct* and *efficient* drive—demonstrated for ten years in England—and proven in this country for over two years in every class of light and heavy service in which Pierce-Arrow worm driven trucks have been operated.

PIERCE-ARROW
5-TON MOTOR TRUCKS
THE PIERCE-ARROW MOTOR CAR COMPANY, BUFFALO, N. Y.

Coventry Noiseless Chains as Used on "Benz" Engines

COVENTRY
NOISELESS CHAINS

Have been the standard of Europe for many years. These chains run with remarkable accuracy and precision, their construction and design make them positive and flexible.

Standard equipment on the following cars: **Daimler, Deasy, Humber, Maudslay, Benz, Arrol-Johnson, Vauxhall, etc.** Write for full description and details.

UNITED STATES REPRESENTATIVES:

Sarco Engineering Co., 110 Broad St., N. Y.

Motor Truck Bands

MADE WITHIN THE FOLLOWING

Dimensional Tolerances

(ADOPTED BY THE SOCIETY OF AUTOMOBILE ENG.)

1.—Tolerance in circumference of felloe band:

	Plus	Minus
Before application to wheel	1-32"	1-32"
After " " "	1-16"	1-32"

Variation from precise measurement shall be uniform over entire width of band.

2.—Tolerance in width of felloe band:

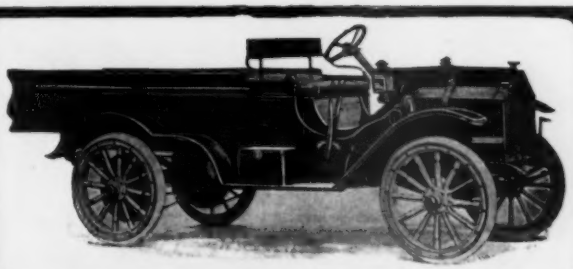
	Plus	Minus
Up to and including 4"	1-32"	1-32"
4—1-16" to 6"	3-64"	3-64"
6—1-16" to 12"	1-16"	1-16"

3.—Variation in trueness of band when placed on surface plate: Band shall touch at all points within 1-32" up to and including 6" width. Over 6" width within 1-16".

4.—Variation in thickness of band: .006" plus or minus.

5.—Trueness to round. The radial tolerance on the wheel when felloe band is applied shall be 1-16" plus or minus. This plus or minus tolerance must not occur at diametrically opposite points. There shall be no flat spots or kinks in felloe band on the finished wheel.

The Standard Welding Company
CLEVELAND
NEW YORK CHICAGO DETROIT

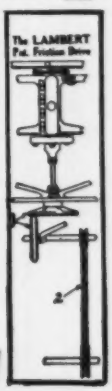


THE LAMBERT MOTOR TRUCK

The first investment is not the most important consideration in the purchase of a motor truck. It is important that you study the construction—what will it cost you in time and money to get like results from different types of cars?

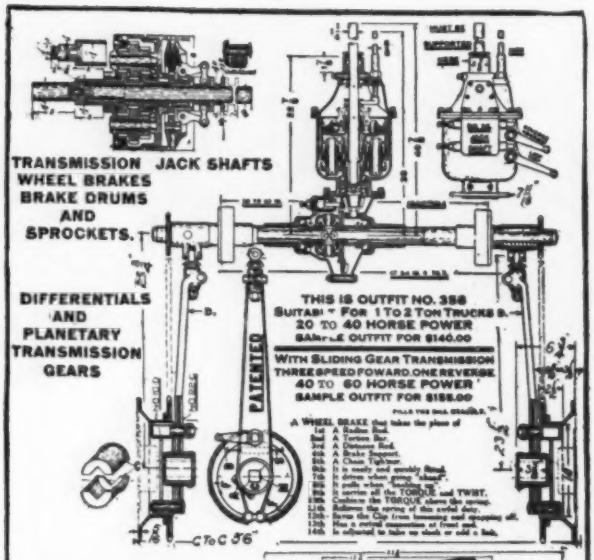
The Lambert Patented Friction Drive will give you more service at less expense than any truck built. This is apparent by studying the illustrations in this advertisement. That on the left shows the usual form of power transmission. That on the right the **Lambert Patented Friction Drive.** Six expensive complicated units, as compared to two simple components. Granted that the results from the gear transmission are equal to the friction, which is the more economical? The cost of lubricating oil alone in the one on the left, will amount to more than the replacement of parts on the **Lambert Friction Drive.**

The Lambert is trouble proof, and cannot be damaged by carelessness or inexperience. It overcomes the chief objection to commercial cars.



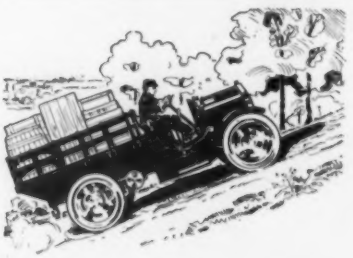
We have prepared some very interesting literature for you. A card brings it to you.

The Buckeye Manufacturing Co.
146 Columbus Avenue
ANDERSON, INDIANA



HEAVY BUILT SLIDING GEAR TRANSMISSIONS 3 SPEEDS FORWARD, ONE REVERSE FOR 20 TO 60 HORSE POWER. FOR TRUCKS CARRYING 1 TO 4 TONS

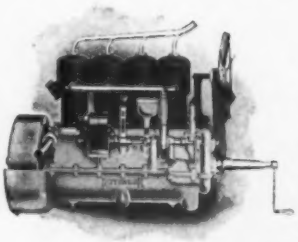
MUNCIE GEAR WORKS. MUNCIE. IND.



All Roads Are Level

to the truck that places its reliance upon

THE RUTENBER MOTOR



This is the motor that is built for service, speed and silent performance. It cuts your motor costs in half and doubles your efficiency. Write for the record of this motor and for list of power trucks carrying the RUTENBER.

The Rutenber Motor Co., Marion, Ind.

Do the Brakes On Your Truck Act Instantly

Or do you have trouble? Nothing is *so* important as quick-acting, positive brakes—brakes that hold whether truck goes forward or backward.

DUPLEX EXTERNAL BRAKES

are the best brakes the industry produces. If you're having brake troubles, DUPLEX will cure them. Write us. Perhaps we can help you.

The Royal Equipment Company

484 Housatonic Ave., Bridgeport, Conn.

We also make Raymond Brakes, Raybestos Friction Facing and Gyrex, the Mixer.

"Reliable Springs are More important on Commercial Cars than on Pleasure Cars."

THE PERFECTION SPRING CO.

Cleveland - - - - - - Ohio

Motor Lauth Juergens Trucks

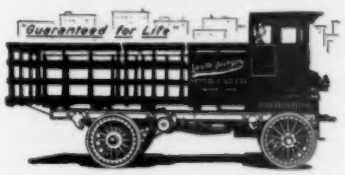
Are Guaranteed For Life

WHAT MORE CAN WE SAY?

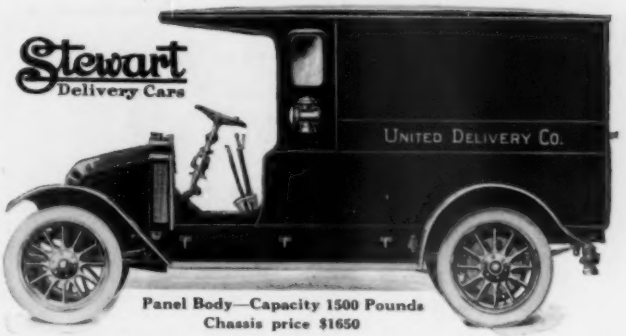
Made in 1, 2, 3 and 5-Ton Sizes

Send for Catalogue

The Lauth-Juergens Motor Car Co.
FREMONT, OHIO



Stewart Delivery Cars



Panel Body—Capacity 1500 Pounds
Chassis price $1650

Stewart Delivery Trucks Make Big Hit With Dealers Everywhere

Live dealers everywhere are finding Stewart Trucks ready sellers and big money makers. Read what they say of these splendid cars:

Our two demonstrators are creating considerable interest. They are quiet as a limousine and very powerful. We hope to sell more than the hundred we have contracted for.
Gomery-Schwartz Motor Car Co., Philadelphia

Our demonstrator received; more than meets our expectations.
Henry C. Riker & Co., Cleveland, Ohio

We congratulate you, first, upon the fine mechanical construction of the car, and second, on its fine appearance and finish. The car is all you claim and more.
Northrup Motor Service Co., Edmonton, Alberta

The cars came through O. K. and run and look above our expectations.
Burg & Wharry Motor Co., St. Paul

Our demonstrator attracts attention everywhere. It looks more than good to us and we expect to make a lot of money selling Stewart delivery trucks.
Crim-Brouner Auto Co., Utica, N. Y.

Fiske, the confectioner, is highly delighted with his panel car. It has abundant power and takes the big hills in Baltimore on high gear. We already have a number of excellent prospects lined up.
R. Stuart Beaver, Baltimore

Some Stewart features: 30 h. p. Continental motor; Brown-Lipe selective transmission; demountable rims; left-hand steering; center control; wheelbase 126"; large loading space; complications eliminated. Chassis $1650.

Write at once for our liberal proposition to dealers.

Stewart Motor Corporation. Buffalo. N.Y.

T. R. Lippard, Pres. and Mgr.
R. P. Lents, Sec. and Treas.
R. G. Stewart, Vice Pres. and Chief Eng'r.
Robt. W. Ingersoll, Sales Mgr.

Separate from and having no connection with the Lippard-Stewart Motor Car Co.

The Importance of the Battery in "Electrics"

The reliability of electric vehicle service depends largely upon the battery used.

For dependability, long life, rough service, and economy in operation,—

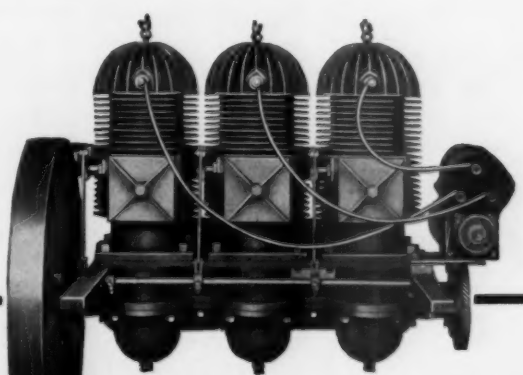
"Exide" Batteries

have no equal. These batteries—the "Ironclad-Exide", "Exide", "Hycap-Exide", and "Thin-Exide"—have been developed to meet the special demands of all types of electric vehicles.

Let us aid you in choosing a battery for your "Electric" which will give you the best service at the least expense. Our recommendations are backed by an experience of 24 years in the manufacture of storage batteries. It will surely pay you to get in touch with our nearest Sales Office.

THE ELECTRIC STORAGE BATTERY CO.
PHILADELPHIA, PA.

New York Chicago Cleveland Detroit San Francisco
Boston St. Louis Atlanta Denver Toronto



AT LAST

The Perfect Two-Cycle Motor with Variable Port-Areas

The essential feature of Moore Motors is the increasing or decreasing of all the port-areas simultaneously (fully patented), giving flexibility of control and fuel economy.

(Fixed ports, as in regular two-cycle design, mean lack of flexibility and high fuel consumption.)

The result is a power plant combining two-cycle simplicity and low upkeep cost, with four-cycle flexibility of control and fuel economy.

Moore Motors are backed by years of engineering experience. Send for descriptive circular.

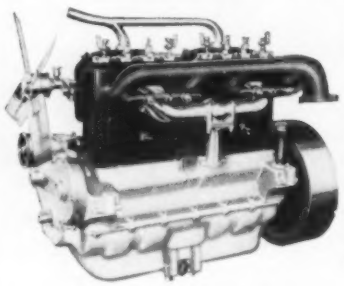
PALMER-MOORE COMPANY
SYRACUSE, NEW YORK

CONTINENTAL
Commercial Motor

The Mark of a Good Truck

The new heavy duty Continental—one ton and seven ton capacity—carries all the approved improvements:

Long stroke; large valves; heavy bearings; enclosed valve mechanism; perfect lubricating system.



Unit power plant or independent motor.

The Continental's reputation for reliability, for power, for economy and efficiency, have made it the mark of a good truck.

Write for specifications, prices and terms

Continental Motor Mfg. Co., Detroit, Mich.

Factory Representative
K. F. Peterson, 122 S. Michigan Blvd., Chicago, Ill.

The Eureka Non Skid for Dual Tires

Gives traction in any place where the wheels of the truck can be turned.

Does ***NOT*** injure the tires.

Don't let the weather tie up your delivery service, have a pair of ***Eureka Non Skids*** in every truck for an emergency.

Prices:

For tires 36 inches or under $25.00 per pair

For tires over 36 inches $30.00 per pair

EUREKA NON SKID MFG. CO.
591 BERGEN ST. BROOKLYN, N. Y.

A Steadily Increasing Demand Is the Best Proof of Satisfaction

During the month of October

Goodrich Wireless Tires replaced 570 tires of other makes

If you are planning to buy a motor truck

Specify

GOODRICH WIRELESS MOTOR TRUCK TIRES

[Demountable—Block—Pressed-on—Electric]

The B. F. Goodrich Company
Akron, Ohio

WE WANT AGENTS

to share in the **GOOD WILL** of a corporation with **$6,000,000.00** of capital, with twenty years experience and with 20,000 customers. Our **SIX** factories at Detroit, Cleveland, Erie, Pa., Chicago Heights, Ill., and Franklin, Pa. (2), are turning out high-grade machinery products that are sold and used in every corner of the globe.

The "Little Giant" Commercial Car is one of these products

Capacity One Ton

Any Style of Body

WRITE FOR PRICES AND TERMS. ADDRESS DEPT. M

CHICAGO PNEUMATIC TOOL CO., General Office, 1010 Fisher Bldg.

Branches Everywhere. New York Office, 50 Church St.

WHAT "FERRO" SAYS—

"We can hold cylinders to Standard Size a great deal better with a grinder than we can with a reamer."

The Ferro Machine and Foundry Co.
Cleveland, Ohio

This Firm uses Heald Cylinder Grinding Machines EXCLUSIVELY, AND HAS 18 OF THEM IN OPERATION

They have made a very careful study of the manufacture of gas engine cylinders, both as to the matter of production and the efficiency in handling, so that every move counts in getting them out rapidly and to a high standard of accuracy.

Our booklet "Cylinder Grinding" tells all about it. If you haven't read it, send us your name and we will mail you a copy free.

THE HEALD MACHINE COMPANY, 12 New Bond Street, Worcester, Mass.

When Writing, Please Say—"Saw Your Ad. in the C. C. J."

The Ward Bread Co. of New York has 100 Electric Delivery Wagons Equipped with Westinghouse Motors

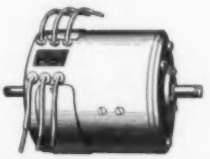
Users of large fleets of Electric Commercial Cars Specify

Westinghouse Vehicle Motors

because of their **proven** reliability and efficiency.

From the time the electric vehicle was first a commercial success Westinghouse motors have maintained a continuous record of satisfactory performance under all conditions of vehicle service.

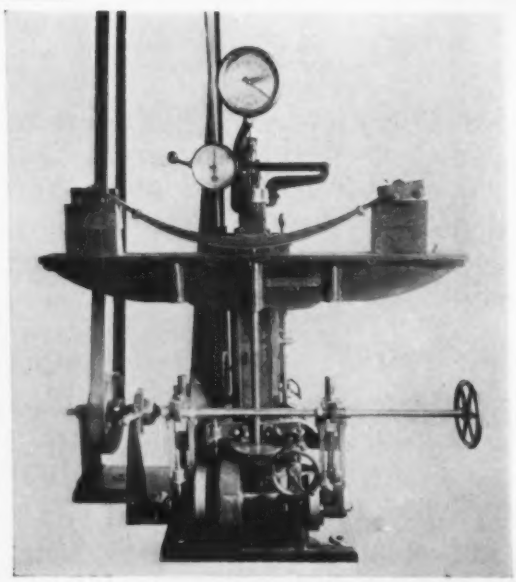
This excellence is due mainly to two causes: First, the Westinghouse Company never places electric vehicle equipment on the market until exhaustive service tests have proved it to be better than the operating conditions require. Secondly, the Westinghouse Company co-operates with vehicle manufacturers and aids them in selecting electrical equipment to produce the most serviceable and efficient cars.



A list of vehicle manufacturers supplying Westinghouse equipment will be furnished on request

Westinghouse Electric & Manufacturing Company Sales Offices in Forty-five Cities **East Pittsburgh, Pa.**

VANADIUM



The Anti-Fatigue Steel

This Vanadium Steel Spring was deflected through 145/8 inches under a load of 2700 lbs. without taking a permanent set.

Vanadium Steel Springs surpass all others in endurance and resiliency. Specify them.

Our Ferro-Vanadium is the Standard for Making Vanadium Steel

Booklets and expert advice on application

American Vanadium Co.

Largest Manufacturers of Vanadium Alloys in the World
Immediate shipment—any quantity

339 Vanadium Bldg., Pittsburgh, Pa.

As usual, the verdict favored GOULD Storage Battery

A prospective customer who had heard how good Gould Storage Batteries were but wanted to make sure, wrote, unbeknown to us, to the manager of a large mill (name on application) where Gould Batteries had seen much service in driving their electric trucks. Here is part of the answer he received:

"We have for many years used all makes of storage batteries to determine the best for our purpose and by actual experience and practical tests have come to the conclusion that the Gould is the best lead battery in the market. We now use same exclusively in all our cars built for lead batteries."

Firms that have heavy material to deliver and lots of it don't take chances. Their batteries must develop plenty of power, prove their durability and assure top-notch service at a low ultimate as well as immediate cost per car mile.

Men responsible for the delivery service of large industrial organizations pick Gould Batteries for their own protection, so you can be pretty sure that our pleasure vehicle types, too, are **right.**

We've plenty of evidence of how Gould Batteries handle heavy and light loads, how they perform on long and short hauls and what astonishing improvements they offer on pleasure cars. Tell us your requirements and let us explain why Gould Batteries are the logical choice. At least, write for literature.

Gould Storage Battery Co.

General Offices: 341 Fifth Ave., New York

Boston: 89 State Street. San Francisco: 904 Rialto Bldg.
Chicago: The Rookery. Cleveland: American Trust Bldg.

WORKS: Depew, N. Y.

Agents in Washington, Kansas City, Denver, Detroit, Topeka, Los Angeles, Seattle, Montreal and Toronto.

Full stock carried in all cities where we have offices or agents.

42

Motor Truck Tires That Greatly Reduce Operating Cost

Owners of motor trucks are coming to realize more and more that economical operation depends largely on tires. That's why Motz Cushion Tires have become first choice among most of the leading truck owners. These are the **real** economy tires.

Saving Power

Again and again has it been demonstrated that a truck travels farther on a given fuel charge when **Motz** equipped than when **pneumatic or solid tire equipped.** Users of Motz Cushion Tires get maximum mileage per fuel charge. Remember that.

Protection to the Car

And these tires are exceptionally resilient and easy-riding. They protect the delicate mechanical parts of a car as effectually as properly inflated pneumatic tires. Don't confuse them with hard, unyielding solid tires, the kind that have ruined so many commercial cars. Note that Motz Cushion Tires have double Tread (A in picture) which prevents skidding and distributes the weight to the sides. The undercut sides (see B) allow free action of the bridges. The slantwise, elastic bridges (see C) give and yield like the air in pneumatic tires. D shows shock-absorbing qualities when tire passes over an obstruction.

More Tire Mileage

Each set of Motz Cushion Tires is guaranteed for 10,000 miles—one year. That's more than most tires offer.

Less for Tire Upkeep

Tire upkeep amounts to practically nothing. Punctures and blowouts are, of course, impossible. Breakdowns, delays, repair bills, from tire causes, carrying extra tires, etc., are also done away with. With these tires on your car it will never be laid up for tire repair. Your motor truck will be **working** and **earning** for you every **hour** every **day.**

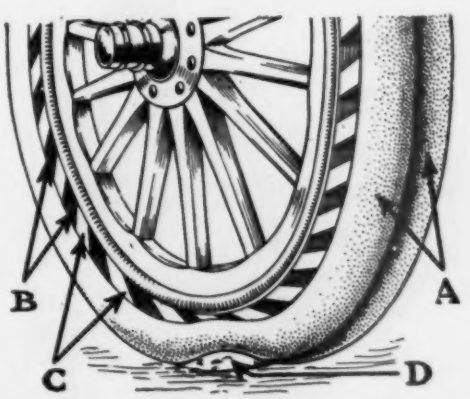
Motz Cushion Tires are easily applied by you to any standard clincher, universal quick-detachable or demountable rim.

Send for our latest tire book 85 and letters from users of Motz Cushion Tires. Give name of Car, Model, Size of Rims, etc. Write today and the book will come by next mail.

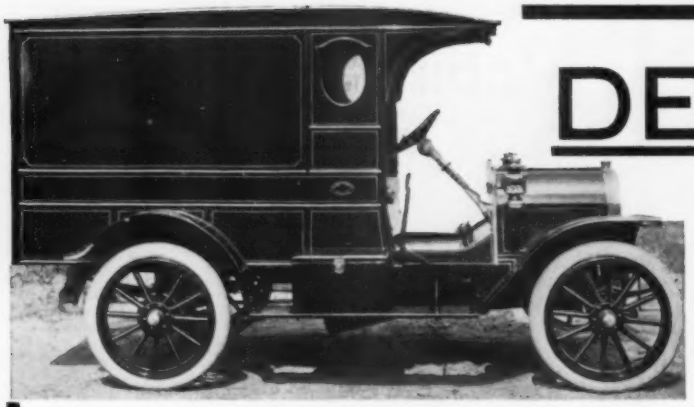
The Motz Tire & Rubber Company

Factories and Executive Offices, Akron, Ohio

BRANCHES:—1737 Broadway, New York; 2023 Michigan Ave., Chicago; 4 Dundee St., Boston, Mass.; 999 Woodward Ave., Detroit; 1932 Euclid Ave., Cleveland; 300 N. Craig St., Pittsburgh, Pa.; 409 E. 15th St., Kansas City, Mo.; 1409 Race St., Philadelphia, Pa.; 336 W. Pico St., Los Angeles, Cal.



Motz Cushion Tires



DEALERS—

We invite immediate correspondence concerning territorial selling arrangements for 1913. We want to hear from that type of dealer who recognizes the exceptional money-making opportunity in selling

The Commerce Car

OUR NEW MODEL "C"
Panel Body, Four Cylinder, 20 H. P., Bosch Magneto, Pneumatic Tires—32x3½—Complete, $875.00. Motz Solid Tires—34x2½—Complete, $825.00

Three models—one chassis. At a price—$850—that makes the **Commerce** a **self-seller.** If you want the big profits to be had in truck selling, **here is your opportunity.**

The Commerce is a **specially built** commercial motor car—not a "converted" pleasure car. Load capacity—1000 pounds. **Built for work.**

Investigate the financial stability of our Company—we give references and require them. Ask any of our dealers for their opinion of **The Commerce** and the rapid sales possibilities.

The winter season is approaching—the best time for motor truck selling. Get in line now and secure **your** share of the business.

THE COMMERCE MOTOR CAR COMPANY

General Offices: 633-639 Penobscot Building ∴ DETROIT, MICHIGAN

INTERLOCKING SPOKES
Strongest, Safest and Most Economical

A commercial truck is built to carry heavy loads, and the wheels must carry both truck and load. They bear the greatest burdens and must stand the greatest strains. Unless they are fully equal to the burdens put upon them, they are unsafe.

STRENGTH, SAFETY, and ECONOMY are assured in the SCHWARZ WHEEL. Spokes interlock, forming a tight, immovable center assembly, which cannot loosen under most severe stress. Will always run true, minimizing repairs and replacements, and saving tires. All the leading motor trucks are run on Schwarz Wheels.

Consult us on design and proportion.

The Schwarz Wheel Company
Frankford, Philadelphia

FEDERAL GRIPS

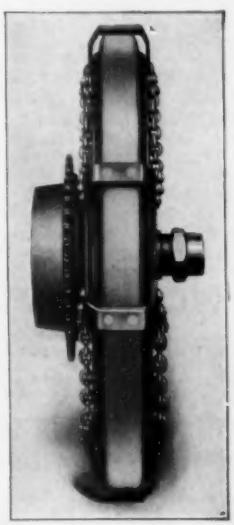
are designed and made expressly for solid tires—the more severe the conditions, the greater their merit stands out.

FEDERAL Grips are time savers, being quick attachable in every sense of the word. Jack or special tools not required in application of grips—your hands and two minutes are needed—that's all.

FEDERAL Grips fold up in a very compact form when not in use—they can be conveniently carried on the car, ready for any emergency.

FEDERAL Grips are made from NICKEL STEEL exclusively, the steel being heat-treated in the most approved manner, making it capable of withstanding more than the ordinary amount of accidental or customary hard usage.

FEDERAL Grips will do the work—not injure the tires—and are mechanically perfect—our guarantee that goes with every set covers that.

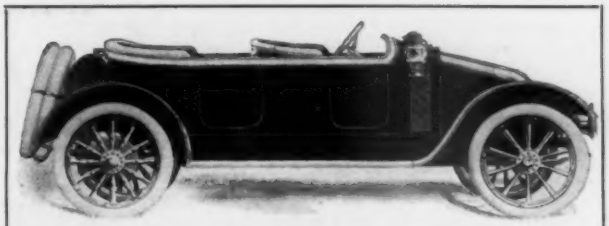


As the LARGEST makers of Traction Grips for Solid Tires in the United States, we are justified in stating that our grips *must* be the best, our methods *must* reflect honesty and fair dealing, and our prices *must* represent true economy to the users.

"Points about Traction Grips and their selection" are covered in our catalog—YOUR copy is ready—it's free.

We also manufacture GAYLOR Grips, for Dual Solid Tires.

FEDERAL CHAIN AND MANUFACTURING CO.
SPRINGFIELD : MASS



The Features the Buyer Wants in Distinctive and Distinguished Cars

CROXTON

Croxton Cars incorporate all of the features for which the buyer looks in the new season models.

Moreover, many of these have been in use on our cars for five years; so, with us at least, they are not experimental.

Others—which some day we predict will be widely adopted—are yet exclusive to the CROXTON.

These are even more valuable to you in a sales way than those which have now become more or less common in other cars.

A glance at what follows will show you that no car is more complete, of more advanced design or more completely equipped:

Short Turning Radius.

Extremely long and flexible Springs.

Quick Detachable Demountable Rims.

Electric Starting and Lighting System.

An extremely long stroke motor; improved ignition system with automatic spark advance, dispensing with spark lever on steering wheel.

Improved Thermo-syphon cooling system.

Radiator protected from damage and from mud and water splashing by being placed at rear of motor; no hot air from radiator passes over motor. Improved oiling system. Left-hand drive, with steering gear of new design. Center control. Clutch and transmission enclosed as a unit. Gasoline tank incorporated with cowl dash. Motor protected by hood from dust, dirt and water.

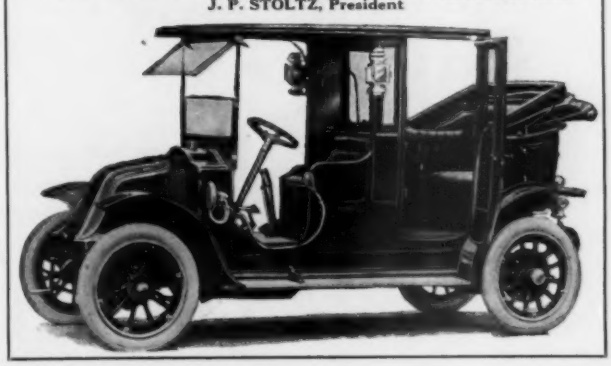
Particularly attractive and distinct body lines.

We are now located in our new factory, with the best and latest machinery, and most complete facilities.

Our Sales Force is yet to be completed by the addition of a few good dealers.

Full details and specifications will be mailed for the asking.

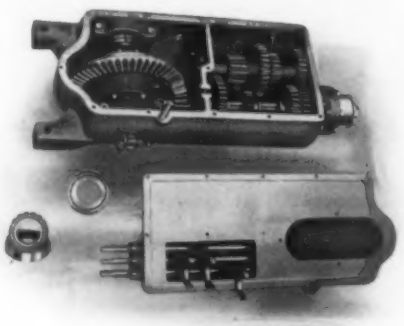
THE CROXTON MOTOR CAR CO., WASHINGTON, PENNSYLVANIA
J. P. STOLTZ, President



WARNER-TOLEDO

Write us relative to our durable and efficient

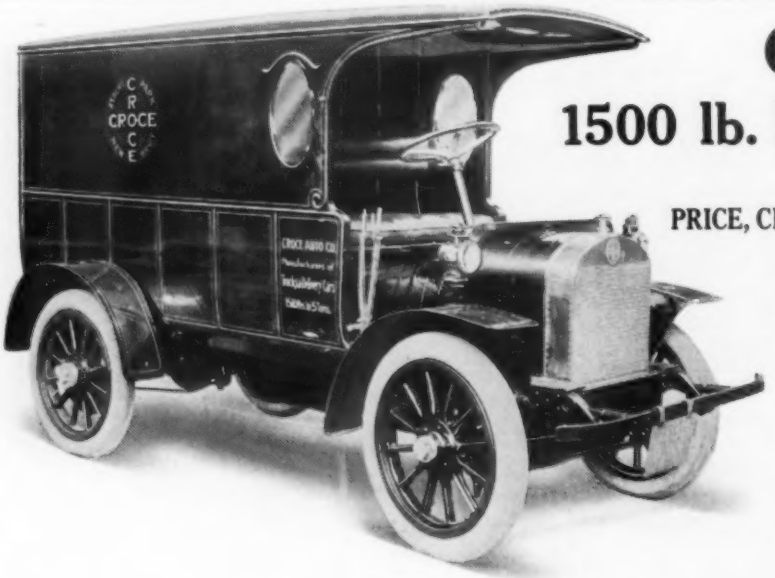
COMMERCIAL TRANSMISSIONS



2 to 3 Ton Capacity

The Warner Manufacturing Company

Toledo, Ohio, U. S. A.



CROCE

1500 lb. Delivery Wagon

(Closed Body)

PRICE, CHASSIS, $1,650. COMPLETE, $1,850

Croce Commercial Cars are in a class by themselves, just the car the business men have been looking for so long. The best materials that money can buy are none too good for Croce Cars.

THE CAR THAT IS BUILT TO LAST TEN YEARS. Built fool-proof. Anyone can handle it without injuring the car.

There are some men who figure economy in the buying of a car by the lower price; the wise men figure on the life of the car.

There are many cars built for one year's service, two years the limited life. Those cars sell for about half the price of the Croce Car, which is built to last ten years and will outwear five other makes of cheap cars with less trouble and expense. Where does the economy come in?

SPECIFICATIONS OF CROCE 1500 lb. DELIVERY CAR:—

Motor, 4 Cylinder, 4-cycle block, with 3 main large bearings (crank shaft 1¼). **Bore** 3¾, stroke 5 inches, L-head. **Magneto,** Bosch High tension. **Carburetor,** Schebler Model L. **Clutch,** Cone, pressed steel with roller control; no wearing parts except when changed speed; **Croce Patent. Joints, Spicer universal,** on clutch and rear. **Transmission,** 3-speed and reverse, sliding gear type, with Timken roller bearings. **Rear axles** full floating type, the largest Timken make, with Timken roller bearings. **Tires,** 34-4½ front and rear (pneumatic). **Front axle,** Timken front with Timken roller bearing on wheel and head. **Radiator,** tubular type, Kells make, with Croce patent soled bottom; guaranteed never to leak or get out of order (barring accident). **Steering Gear,** screw and nut type, every wearing part automatically taken up, with no back lash. **Springs,** Croce design, for easy riding with and without load; special chrome vanadium spring steel of the highest grade.

Croce Commercial cars are not built of cheap materials to meet others in price, but are built on sound business principles for the business man who wants a car to last 10 years, and for the man who knows a good car when he sees it.

The first Croce car was built in 1905; all our product was sold, and built up a reputation locally in New Jersey, until this year, when a large plant is under way with 40,000 square feet of floor space.

Good territory is now open for the sale of Croce trucks of from 1500 lbs. to 5 tons capacity. Send for Catalogue and full information.

CROCE AUTO CO., ASBURY PARK, N. J.

LAVIGNE

Steering Gears

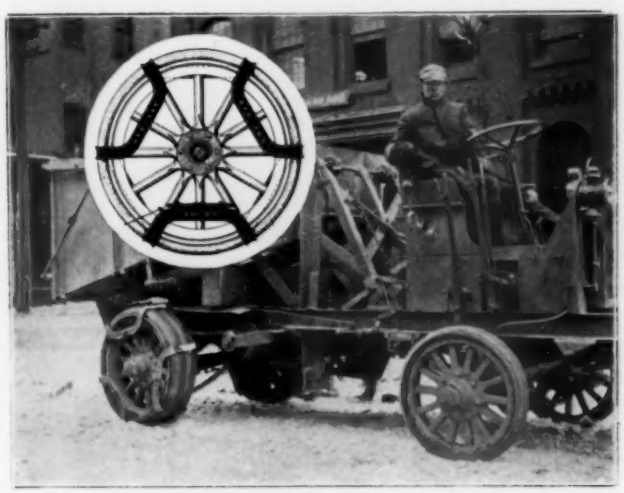
POSITIVELY No Back Lash
No End Thrust
No Loose Parts

Takes Up Automatically

FOR TRUCKS
DELIVERY WAGONS
TAXICABS

Positive
Compact
Dust-Proof
Irreversible

THE LAVIGNE GEAR CO.
Station "A," Racine, Wis.



Never Mind The Mud Holes

You won't have to keep an emergency truck busy after a December snow and thaw, if you equip each of your trucks with a pair of

Lyon Solid-Tire Grips

They are put on or off in a few moments: in snow or on muddy roads you leave them on all day, or a week, or a month, if necessary.

They supply the "bite" when the going is at its worst. They last, in ordinary use, a couple of seasons or longer. They cannot injure the tire and they do not impair the tire maker's guarantee.

Lyon Grips are a scientific solution of the solid tire traction problem. Our catalog tells all about them.

We guarantee Lyon Grips for 2500 miles.

LYON NON-SKID COMPANY, 433 North Broad St., Philadelphia, Pa.

Truck Economy is Dependent

Upon Knowledge of Truck Mileage

Veeder

Hub Odometer

$25

At Your Dealer's or Direct from Factory

You, as a commercial car user, must look upon the money paid for trucks as just as much of an investment as money paid out for supplies, additions, stocks, etc., and *you should insist on a proper return from this investment as well as upon the others.*

To make your truck investment pay it is ***absolutely essential*** that accurate records be kept of the distance the truck travels. By such records, and only by these records, can you check your tire guarantee, your drivers' capabilities, gasoline and oil consumption per mile, cost per ton for each mile, etc., etc.

The VEEDER HUB ODOMETER will do this necessary work for you. It registers backwards as well as forward. It is sealed, so cannot be tampered with or altered. It simply takes the place of the regular hub cap and ***can be attached by any mechanic.***

No Intricate Wiring, No Cables No Magnets, No Tubes

All we need to know is make, model, size of wheel and year of manufacture of your truck. We ship the HUB ODOMETER to you and you do the rest. Being made by the Veeder Manufacturing Company, whose recording instruments are world-famous in all lines of business, is a sufficient guarantee that the VEEDER HUB ODOMETER is simple, accurate and durable.

Send for Catalogue D, descriptive of HUB ODOMETER.

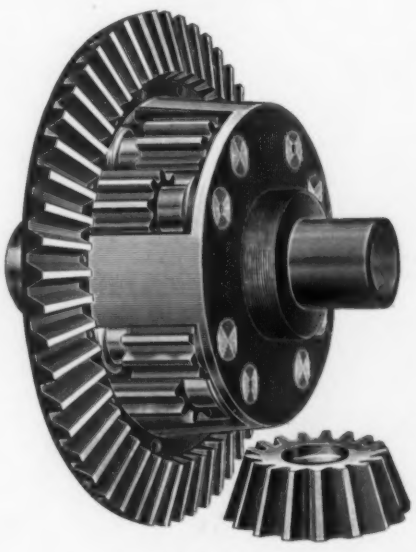
The Veeder Manufacturing Co., Hartford, Conn.

Makers of Cyclometers, Odometers, Tachometers, Tachodometers, Counters and Small Die Castings.

CULLMAN SPROCKETS and Differentials

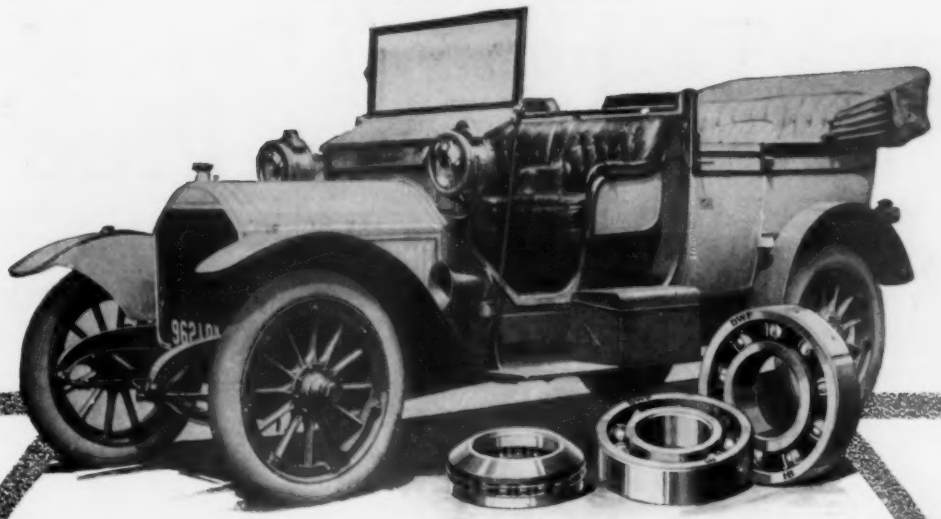
in stock and to order.

Send for catalog and let us quote you on your requirements.



CULLMAN WHEEL COMPANY, CHICAGO

1351 GREENWOOD TERRACE



Crane Touring Car. Built by the Crane Motor Car Co., Bayonne, N. J.
Hess-Bright Ball Bearings used in transmission and both axles,
also in fan, steering gear and clutch shifter.

Where Cost Is No Object

Certain American cars—the aristocracy of their kind—are built, literally, without regard to expense.

Not recklessly, for the mere sake of claiming an expensive car; nor wastefully, by the outlay of money on non-essentials.

No—but scientifically, in the deliberate intent to produce the most efficient, most durable, most luxurious and satisfying car of a given size or power that trained engineering skill can achieve.

Such cars are never cheap. But they give a sense of finality, of perfection and faultless service, which the car built to sell at a price never can touch.

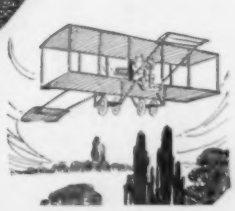
Probably you can name those cars; some have great names; others are built for a few initiates only. But it is significant that these patrician cars—into which only the best of everything enters, regardless of expense—are generally equipped with

HESS-BRIGHT BALL BEARINGS
Built for Endurance

An interesting booklet, giving the reasons for Hess-Bright durability, will be sent to any address on request. It gives facts—not mere generalities.

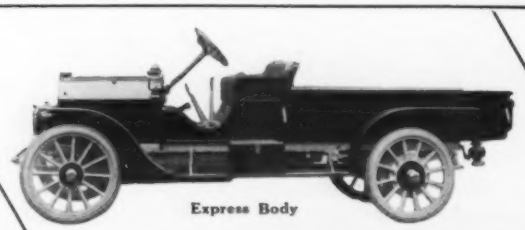
THE HESS-BRIGHT MANUFACTURING COMPANY

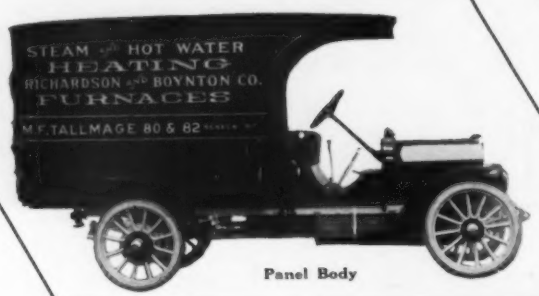
41 East Erie Avenue
PHILADELPHIA, PA.



"The Menominee"
Motor Truck

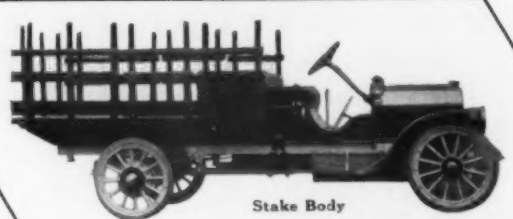
1500 lbs. Carrying Capacity, Express or Stake Body - **$1200.00**
2000 lbs. Carrying Capacity, Express or Stake Body - **$1500.00**


Express Body



Panel Body

Express Body With Top Over Driver's Seat


Stake Body

Special Features In
"The Menominee"

Four-Cylinder Unit Power Plant,
Three-Point Suspension.
Sliding Gear Transmission.
Gear Reduction.
Shaft Drive.
Full-Floating Rear Axle.
Three-Point Platform Spring Suspension.
Easy Accessibility to all Parts.
Beautiful in Design.

Simplicity, Practicability and Durability are the potent features which have made "The Menominee" Motor Truck recognized as the Commercial Car meeting the exact demands of the trade and the best seller on the market.

Send For Our Free Illustrated Catalog and Agency Proposition

D. F. POYER COMPANY
MENOMINEE - - - MICHIGAN

COMPLETE INSTALLATIONS — GASOLINE **GMC** ELECTRIC — COMPLETE SERVICE

TRUCKS

Model K
Capacity 5 tons
Price,
Chassis only,
$4400

Father of a 15-truck fleet

Recently, James Butler, Inc., the great New York chain grocery house, ordered five additional G M C trucks, making fifteen in all. This company has largely standardized its equipment with G M C models. They are getting *service every day* that has revolutionized their immense haulage.

Long distance deliveries are simplified by these powerful trucks, which are at work day and night. The Butler Company has so systematized its service as to make every one of these fifteen trucks pay handsome dividends.

The Butler Company has studied the truck situation thoroughly, because its installation of one truck dates back to January, 1910. It has been convinced by *actual service* and *durability* that G M C trucks meet *every* requirement down to the smallest detail.

Proof of the reliability, efficiency and economy of G M C trucks is the constant repeat orders by users who give their equipment the hardest service.

G M C trucks are built for every kind of haulage from the 1000-lb. type up to 6 tons in standard-capacity models. General Motors Truck Co., in fact, was the first to recognize not only the necessity for trucks of all standard capacities, but was the *first* to build both gasoline and electric types. Types to meet every demand.

So highly standardized a line as the G M C must appeal to business men. Whether one truck or a fleet is purchased, it is necessary to look to the future—to the *continuance* of that line, to the *reputation* of the manufacturer, to his *financial* stability and *engineering* and *mechanical* capacity. General Motors Truck Co. is building for the future, as well as for today—a policy adopted at its inception.

Correspondence from prospective purchasers and dealers is invited. Write for gasoline and electric catalogs.

GENERAL MOTORS TRUCK COMPANY

29 Cadillac Ave., PONTIAC, MICHIGAN

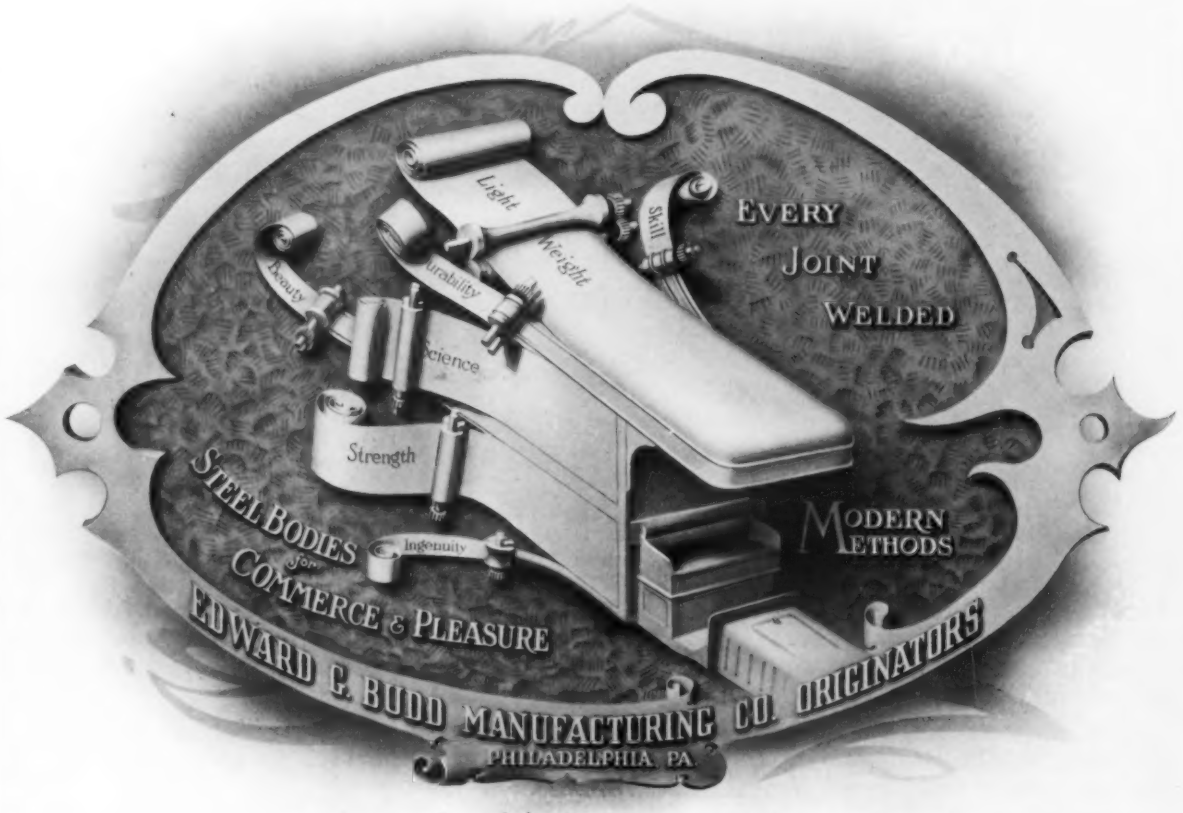
Branches: New York, Chicago, Boston, Philadelphia, Kansas City, Detroit, St. Louis.

When Writing, Please Say—"Saw Your Ad. in the C. C. J."

Pressed Steel Bodies

for

Pleasure and Commercial Cars



All Bodies Built of Special Pressed Shapes, Welded and Riveted; All Joints and Sharp Corners Eliminated.

Workers of Sheet Metal

OUR FACTORY IS EQUIPPED WITH SPECIAL MACHINERY TO SUPPLY BODIES ON SHORT NOTICE.

Designs and Prices Furnished on Application.

Light in Weight
Maximum Strength
Attractive Design
Newest Methods

Makers of Difficult Shapes in Sheet Steel

Edward G. Budd Manufacturing Company

Ontario & I Streets - - - - - Philadelphia, Penna.

Garford TRUCKS

GARFORD trucks bring biggest results for smallest cost. In other words, they stretch delivery dollars furthest.

Discuss Garford construction with any prominent transportation engineer. Ask him, urge him to pick a weak part. Talk trucks with Garford owners; get their viewpoint. To aid you we will send you the names of local owners immediately on request.

Here are the Garford reasons. They are good solid whys and wherefores.

Garfords have correct weight distribution—66 and 34 per cent on front and rear axles respectively. The frames are made of indestructible pressed steel, riveted, bolted and strengthened by five sturdy cross sections. The entire load is carried on Krupp steel springs.

With conscientious maintenance a Garford will not show appreciable wear short of five years. It cannot be abused; in fact, the entire machine is completely protected. The motor is automatically governed. No driver can race it, nor can he exceed a ten-mile speed.

No truck has as large loading space for the wheelbase as the Garford. No truck can have, whose motor is not alongside the driver's seat—practically under his feet. And in no truck but the Garford is it so situated.

This motor placement eliminates the overhang bugaboo. The Garford has not only the smallest wheelbase—but also the least overhang.

Garford straight line drive and four speed transmission puts every bit of power behind the load—no wasted effort.

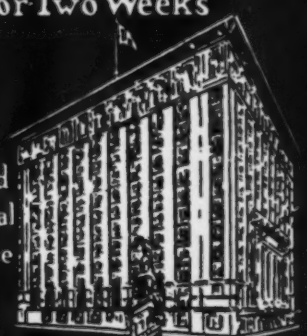
We have records to back up these statements. Write us your delivery problem; we have data which means dollars to you. Please address Department 11.

The Garford Company, Elyria, Ohio

NATIONAL

AUTOMOBILE SHOW

In Two Buildings For Two Weeks



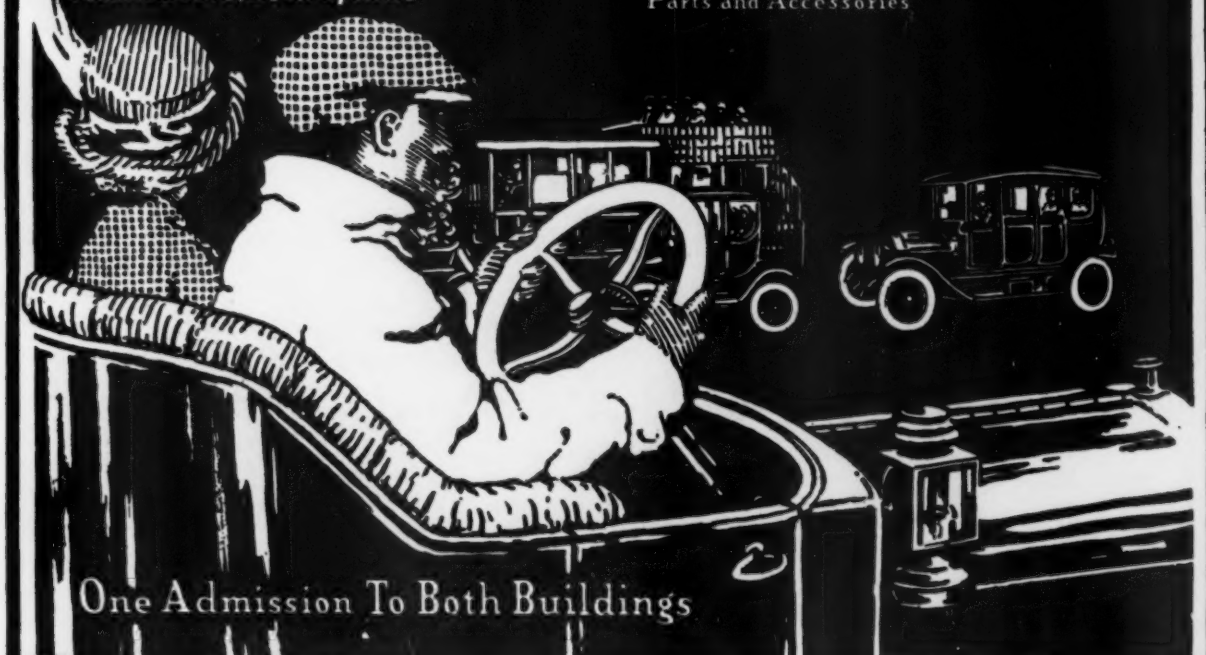
Grand Central Palace

Lexington Avenue 46th-47th St

Madison Square Garden
Madison Ave. 26th-27th St

January 20 to 25
Commercial Cars
(Gasoline and Electric)
Parts and Accessories

January 11 to 18
Pleasure Cars
(Gasoline and Electric)
Motorcycles
Parts and Accessories



One Admission To Both Buildings

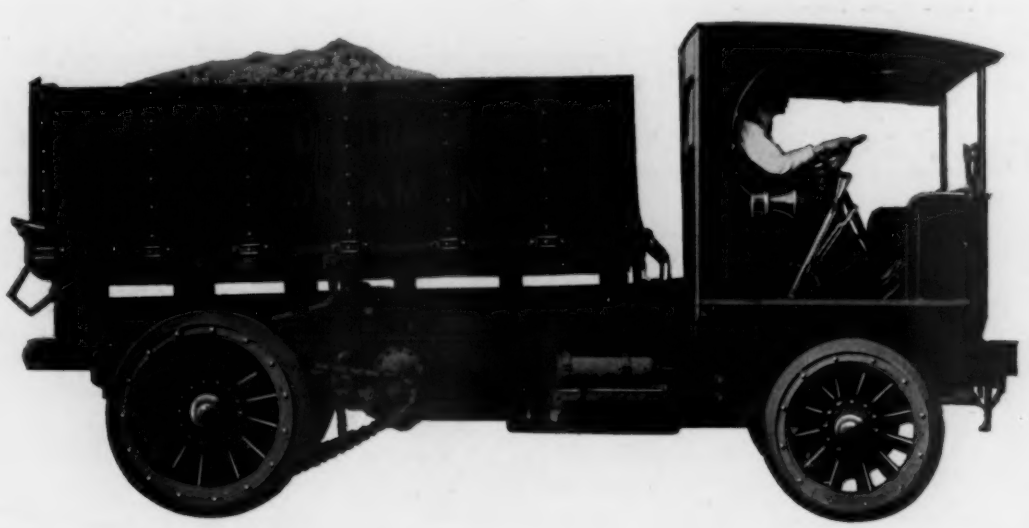
GRAMM TRUCKS

GRAMM transportation plans and truck equipment have done more toward economically re-organizing transportation problems than any other means yet introduced.

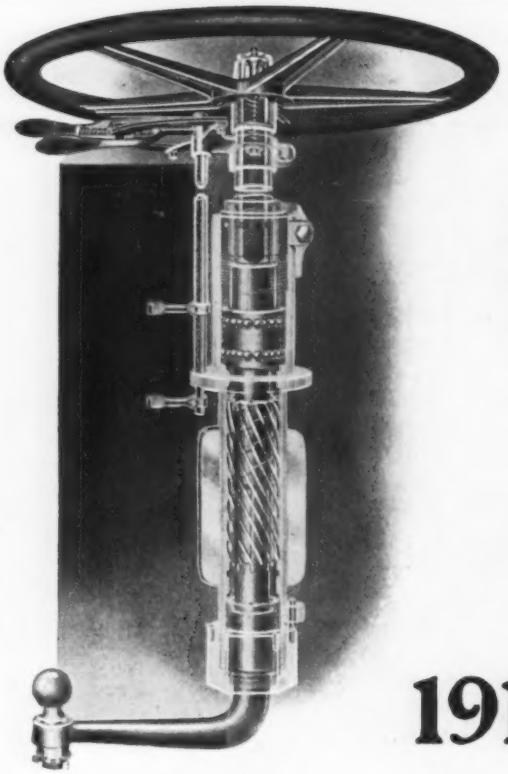
Investigate.

Please address Department 12

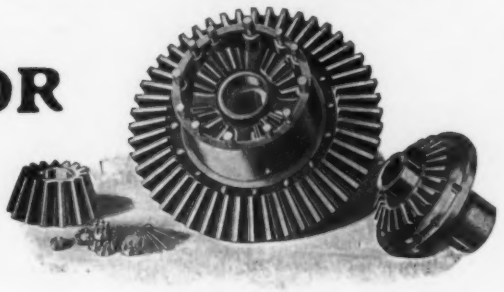
The Gramm Motor Truck Company
Lima, Ohio



When Writing, Please Say—"Saw Your Ad. in the C. C. J."



ROSS
Steering and Differential GEARS
FOR 1913

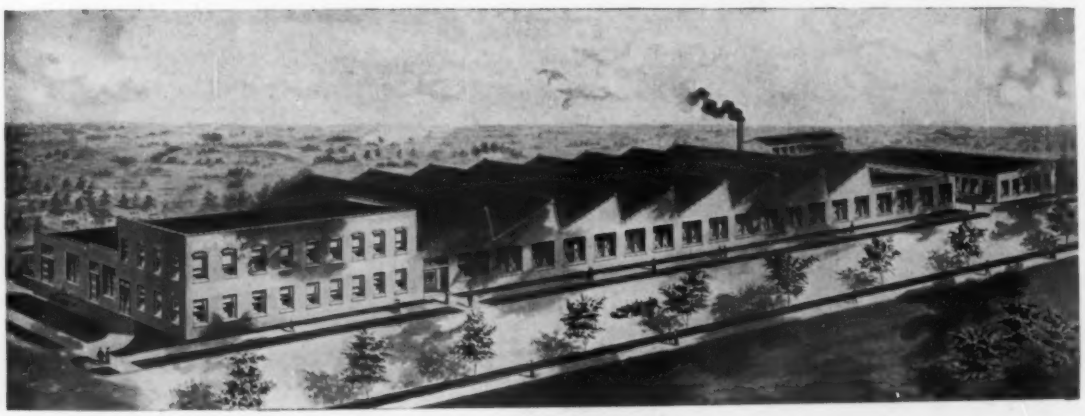


¶ In designing your new models or making changes in your present models, investigate ROSS steering and differential gears. They are the standard on motor trucks, and are the result of six years' experience.

¶ The highest grade material is used throughout their construction, and they are subject to the most rigid inspection.

¶ FURTHERMORE, they are made in the best built, newest, and most completely equipped mechanical parts factory in this country.

ROSS GEAR & TOOL CO., 790 Heath St., Lafayette, Ind.



When Writing, Please Say—"Saw Your Ad. in the C. C. J."

THE KREBS—"The Car That Thinks"

With Its Governor Every Driver Is An Expert

Model B, Krebs Commercial Car with standard delivery body, screened.
Guaranteed capacity, ¾ ton.
Price of Chassis with shaft drive as shown, or chain driven, $1375

Set the governor of the Krebs at any desired speed per hour and it maintains that rate---up hill---down hill---or on the level, with the minimum of fuel needed.

The Krebs is more economical—by reason of its marvelous governor—than any car driven by human judgment.

No matter what the road conditions, its speed is constant at any rate desired, from its maximum down to two miles per hour.

The governor automatically gives the motor just enough gas to overcome grades; shutting off the fuel with each descent or level stretch.

Efficiency and economy are built into the Krebs. You need not fear to intrust it to an inexperienced driver. *He has nothing to do but steer.*

Unlike all other "governed" cars, speed can be changed while running, but unless the governor is changed, it will always keep the motor at the speed indicated.

Model A has a chain-driven chassis and solid tires, with standard Open Express Body and Cab Seat. Guaranteed capacity, one ton. Price, $1,510. Speed up to 15 miles per hour.

Model B, as shown above, is fitted with shaft-driven chassis and pneumatic tires. Guaranteed capacity, ¾ ton. Price, $1,550. Speed up to 20 miles per hour.

The Krebs motor is valveless; its minimum of parts makes it the least expensive in repairs and maintenance.

The liberal equipment includes storm shield with front and side curtains, fitted with celluloid windows—affording complete, enclosed protection for the driver.

The Krebs is a splendid proposition for dealers, because in size, capacity and price it appeals strongly to the largest possible number of users. Add to those qualifications Krebs economy, simplicity, and the positive action of its governor and it offers greater advantages both to dealer and owner than any other car ever built for commercial use.

Write today for complete information

THE KREBS COMMERCIAL CAR CO., Clyde, Ohio

SHELDON

1913

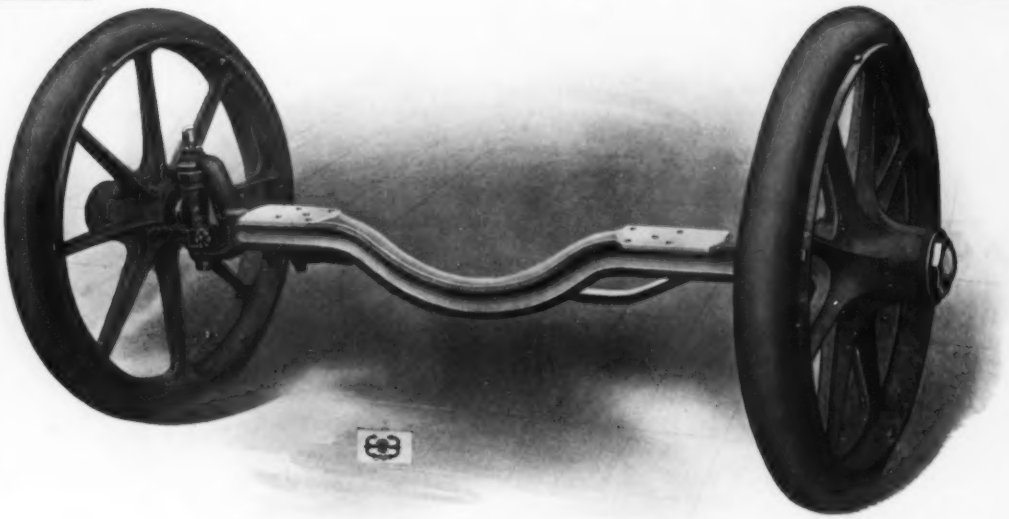
ONE-TON EQUIPMENT

consisting of

3-F-A-1 FRONT AXLE and R-A-1 REAR AXLE

E-11 BRAKES J-1 JACKSHAFTS

is now ready



Sheldon One-Ton Front Axle 3-F-A-1 with Steel Wheels. One-Piece I-Beam center, with integral spring pads. Steel Wheels, 4 times stronger than wood wheels, and 20% lighter.

BEARINGS—
- *Standard Taper Roller*
- *Bower Straight Roller*
- *New Departure Double Row Annular*
- *Rhineland Double Row Annular*

All are interchangeable with our steel wheels, or hubs

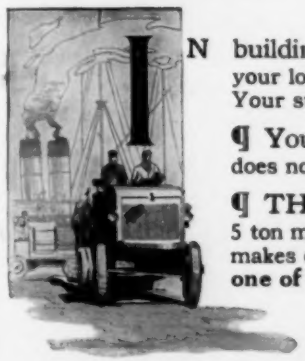
SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE—68 East 12th St. DETROIT OFFICE—1215 Woodward Ave.

When Writing, Please Say—"Saw Your Ad. in the C. C. J."

THE Durable Dayton

A Word to Thinking Dealers



IN building a **lasting** business,—one which will endure indefinitely, your local business reputation must be backed up with dependable goods. Your success depends largely upon the product you sell.

¶ You cannot afford to sell your merchants a motor truck which does not possess lasting qualities.

¶ THE DURABLE DAYTON line of motor trucks (2, 3 and 5 ton models) rank exceptionally high in the industry. There are several makes of high-grade trucks on the market today—**the Durable Dayton is one of the several.**

¶ We seek business connections with that class of dealer who has the honest desire to build his business similar to that of this company. A business of stability, reliability and conscientious dealing.

¶ We are continually creating business for Durable Dayton Dealers with our national advertising campaign, sales co-operation and personal work in the field.

¶ We are best known by the expressed satisfaction of Durable Dayton users throughout the country.

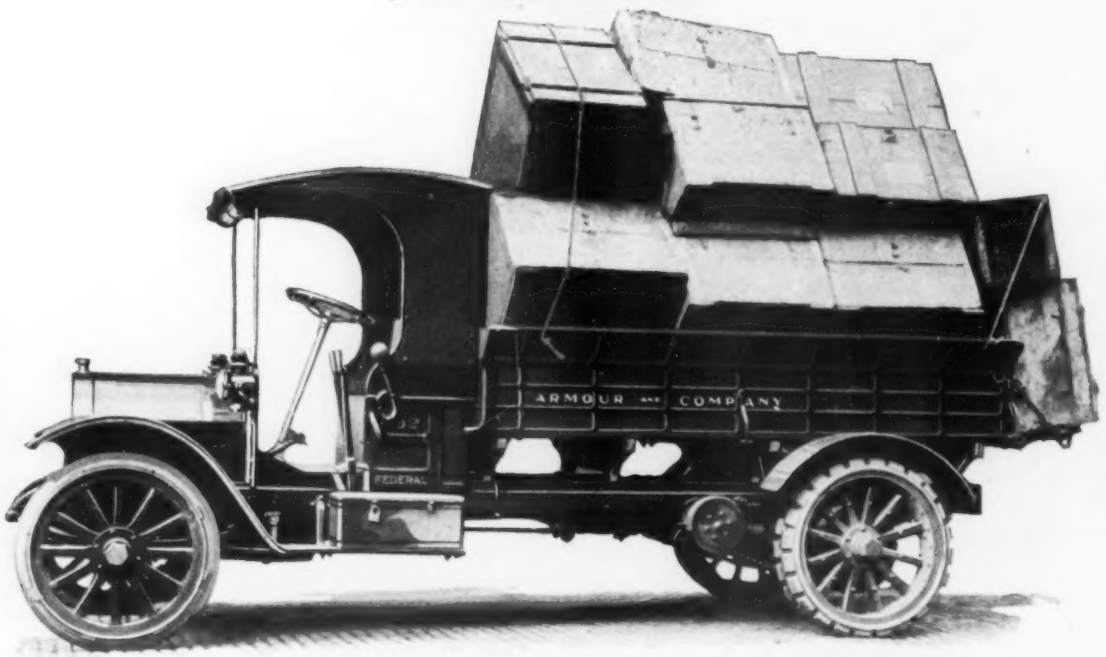
Write promptly for detailed information and complete catalog

The Dayton Auto Truck Company, Dayton, Ohio

Factory Branch, 1700 Wabash Ave., Chicago

3 Ton Durable Dayton in Service with Sauer's Express—Springfield, Mass.

THE FEDERAL
ONE TON TRUCK
$1800



Federal one-ton chassis, including seat, $1800. Body Type at purchaser's Option. Wheelbase optional 110-inch or 144-inch. Motor, 4 Cylinders 30 horse-power. Magneto, high tension, Clutch 16-inch cone. Transmission three speeds forward and reverse. Tires, solid, 36x3½-inch front and 36x4-inch rear. Timken bearings.

Corporations of National Prominence Use from One to Ten Federals

What better proof of Federal quality and character can you ask?

These large corporations of national prominence have studied trucking problems thoroughly and systematically —every angle of them led to the Federal.

These corporations are engaged in most every line of business, in different parts of the United States, conclusively proving that Federal quality and character are not confined to one business or one locality.

CORPORATIONS OF NATIONAL PROMINENCE USING FEDERALS:

Wm. J. Lemp Brewing Company
Armour & Company
Marshall Field & Company
Portland Railway, Light & Power Co.
Ward Bread Company
American Bank Note Company
Detroit Stove Works
Southern New England Telephone Co.
Abbott Motor Car Company

The Federal Motor Truck Company
DETROIT, MICHIGAN
New Factory, Dept. A, Leavitt and Campbell Avenues

THE Detroit ELECTRIC
Commercial Vehicles

Detroit Electric Commercial Vehicles Adapted to Frequent Stops

Mr. Merchant, you will lose or gain on your delivery service, according to the fitness of the equipment you use. Your delivery work probably calls for frequent stops, the delivery of a parcel here, another one across the street, then some a few blocks further, etc. All of which demands, for economy of time and money, quick stopping of the vehicle, quick starting and no loss of time between deliveries to customers. Also there must be no waste of power while the car is standing still, if there is to be the greatest profit from this department of your business.

Detroit Electrics are admirably adapted to meet all these requirements. They are the most practical, on the rigid standard of profit in dollars and cents.

Detroit Electric Commercial Vehicles "get away" instantly. They pick up speed quickly and smoothly, causing no loss of time in starting.

All speeds are controlled with one lever, the application of power being continuous. No loss of headway in changing speeds.

Then, too, they stop quickly and easily, and when the car stops, the power stops—and the expense for power. There is absolutely no loss from useless running of the motor or from wear of parts while your drivers are making deliveries. This feature of the electric vehicle makes it especially suitable for the merchant's use and insures the greatest economy in the use of the delivery equipment

Besides these valuable features of the Detroit Electric, there are the qualities of absence of noise and odor, which make this the ideal commercial vehicle for city and suburban use. They are handsome and trim in appearance and make a distinct advertisement of the progressiveness of the merchants who use them.

Let us take up your delivery problem with you and help you to make the most practical selection of equipment. Our 48-page illustrated catalog will be sent on request.

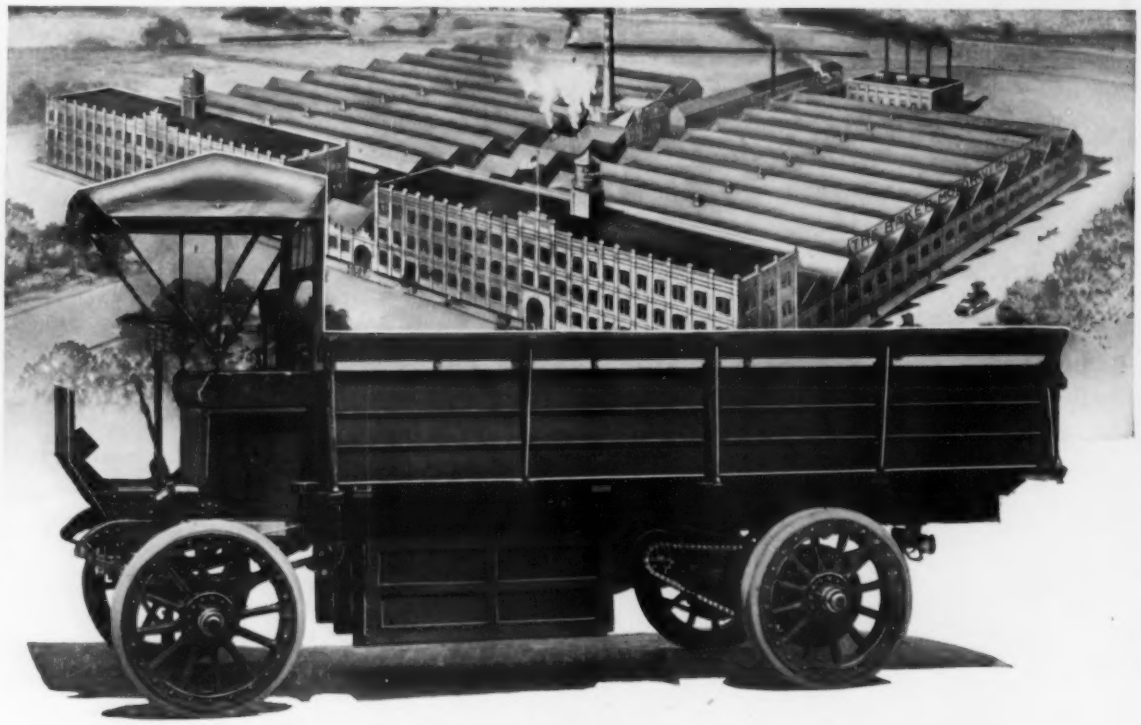
ANDERSON ELECTRIC CAR CO.

456 Clay Ave., Detroit, U. S. A.

Boston
Brooklyn
Buffalo
Cleveland

BRANCHES:
New York: Broadway at 80th Street. Chicago: 2416 Michigan Avenue
Selling representatives in most leading cities

Evanston
Kansas City
Minneapolis



What You Get When You Buy a

Baker Electric Truck

You get the backing and engineering resources of the most perfectly equipped and largest plant in the world devoted exclusively to the manufacture of electric vehicles.

You get the result of 14 years' leadership in developing the electric motor car industry—no experimenting with any other type of machine.

You get a truck built to a standard which has established the criterion of what to expect from a battery-driven vehicle.

You get the most sweeping and far-reaching guarantee ever put on a truck—the guarantee of Baker design, Baker material, Baker construction, Baker workmanship, Baker reputation.

These produce Baker Service—and Baker Service means the maximum in reliability and *money-saving* efficiency.

The Baker consumes less current per ton mile than any other electric truck; this combined with unique simplicity of construction, high grade materials and workmanship, the small number and cheapness of wearing parts makes the cost of operation and maintenance phenomenally low.

We want to demonstrate these facts to you—and to let a representative of our company, or our transportation engineer, tell you without charge or obligation, what the Baker could do for *your* business. Our Transportation Cost Bureau will furnish interesting figures on your individual problems.

500 Pounds to 4 Tons Capacity

Application is solicited from responsible people for representation in open territory.

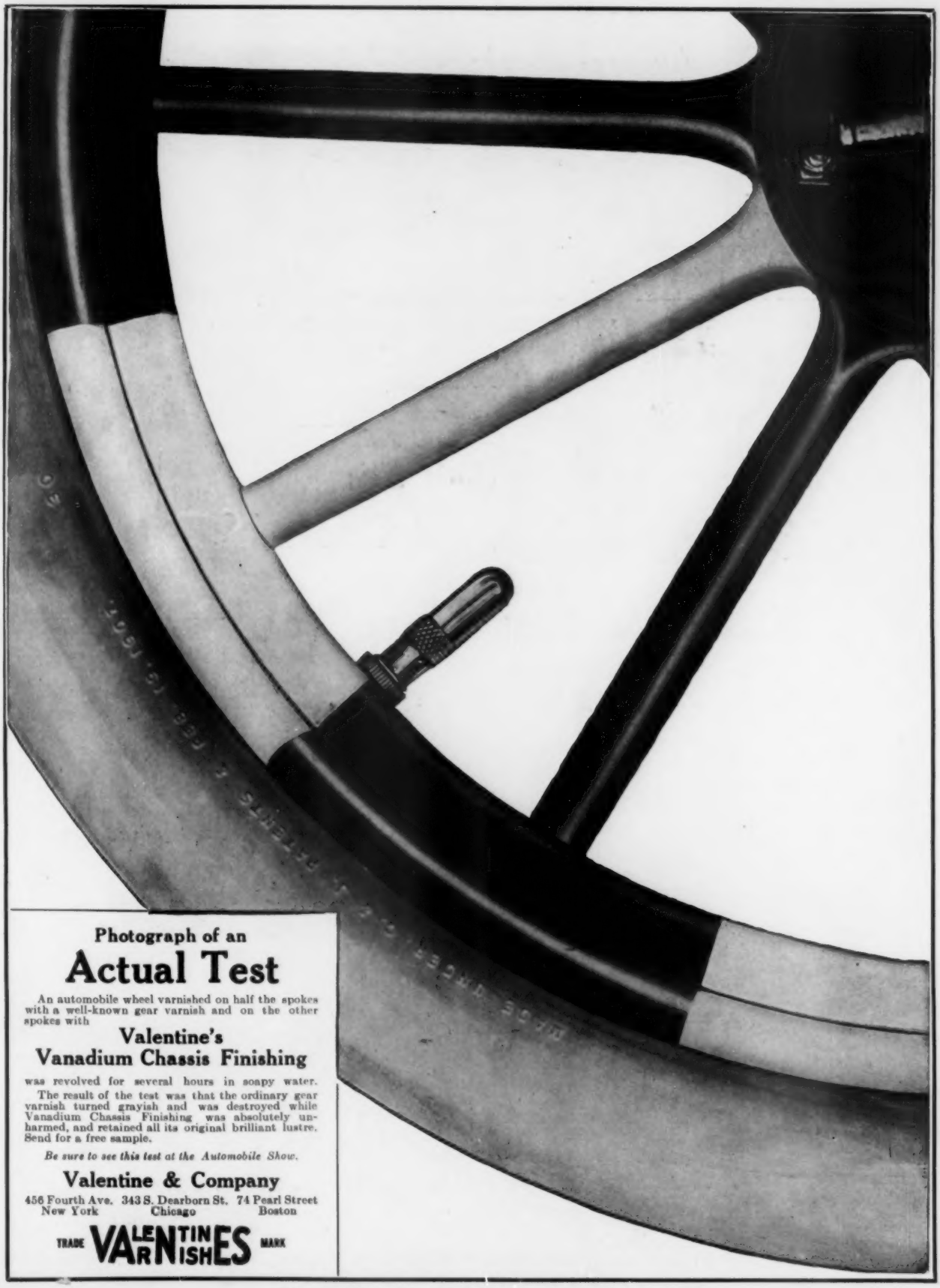
THE BAKER MOTOR VEHICLE COMPANY, CLEVELAND, OHIO

Builders also of Baker Electric Coupes, Victorias and Broughams

Los Angeles, Tenth and Olive Sts. Chicago, 2021 Michigan Av. Spokane, 818 Fourth Av. Sacramento, 1217 Seventh St. Philadelphia, 1927 Market St.
Kansas City, 3105 Gillham Road New York, 1798 Broadway Boston, 801 Boylston St. Richmond, 1623 West Broad St. Denver, 1542 Broadway
Detroit, 815 Woodward Av. Washington, 1138 Connecticut Av. Seattle, 1718 Broadway

Canada: The Baker Motor Vehicle Company, of Canada, Ltd., Walkerville, Ontario

Representatives in Other Leading Cities



Photograph of an

Actual Test

An automobile wheel varnished on half the spokes with a well-known gear varnish and on the other spokes with

Valentine's Vanadium Chassis Finishing

was revolved for several hours in soapy water.

The result of the test was that the ordinary gear varnish turned grayish and was destroyed while Vanadium Chassis Finishing was absolutely unharmed, and retained all its original brilliant lustre. Send for a free sample.

Be sure to see this test at the Automobile Show.

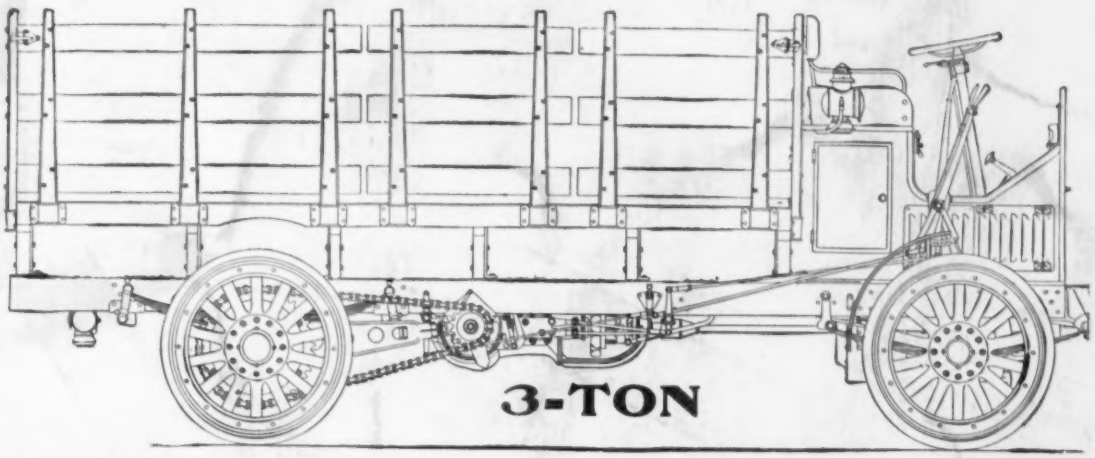
Valentine & Company

456 Fourth Ave. New York — 343 S. Dearborn St. Chicago — 74 Pearl Street Boston

TRADE VALENTINE'S VARNISHES MARK

We Finance the Truck Buyer

The Universal Motor Truck Company Announces the Most Businesslike and Most Liberal Motor Truck Proposition Ever Offered to the Trade.



Here's Our Proposition; It Is Very Simple

A deposit of a **certain percentage** of the cost of the truck **on delivery,** the **balance in time payments,** which will hardly exceed what you would have to pay if you rented a truck by the day.

Why We Can Sell On the Time Payment Plan

Universal Motor Trucks are good trucks

They are guaranteed.

We know that they will give satisfaction or we could not afford to let the purchaser run them for a year on a time payment basis.

Universal Trucks are manufactured in the largest factory in the country devoted exclusively to making high-grade commercial vehicles.

Prices are no higher than trucks sold for cash.

Universal Motor Truck prices are no greater than those of other standard makes of trucks and in some cases they are less.

$2750 for a 2-ton chassis—$3400 for a 3-ton chassis; bodies cost from $150 up, according to your needs. Price f.o.b. Detroit.

There is no longer any question about the economy value of motor vehicles as applied to business.

Do not let your competitors get ahead of you; here's a chance to be up to date; to make the truck pay for itself.

Tell us about your requirements and let us make you a recommendation.

Universal Motor Truck Company

FACTORIES: DETROIT, MICHIGAN

Fred K. Parke, General Manager **507 Theodore Street**